JOHNSTON COUNTY AQUATIC INVENTORY

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JOHNSTON COUNTY AQUATIC INVENTORY

Introduction

Johnston County is a large county (792 square miles) located in the fall zone between the Piedmont and the Coastal Plain of North Carolina, with portions in both physiographic regions. The county lies almost entirely within the Neuse River Basin, which begins in the triangle area of the state and drains directly into the Pamlico Sound. This basin drains 6,235 square miles of land area and contains 3,000 miles of streams.

The Johnston County population in 2000 was 21,965, which is an increase of 50% since 1990. Historically, Johnston County contained chiefly small towns, but with I-40 and I-95 crossing near the center of the county, urbanization has increased rapidly. Johnston County contains 10 municipalities, listed in order of size: Smithfield (county seat since 1771), Clayton, Selma, Benson, Kenly, Four Oaks, Pine Level, Princeton, Wilson's Mills, and Micro. The county's economy is increasingly relying more on tourism and sales. Currently, the county annually exceeds \$1 billion per year in retail sales. In spite of rapid growth, Johnston County has been able to maintain much of its rural character, with a moderate amount of green space remaining in developing communities. Historically, the county's economy was based largely in agriculture and pine plantations that were owned and managed by national timber companies. Johnston County was established in 1746 and has a rich heritage of cultural history, particularly in agriculture and the Civil War. Reenactments of civil war battles, and agricultural, musical, holiday, and other types of festivals occur annually.

The objective of this project was to survey Johnston County for aquatic species, including freshwater mussels, sphaeriid clams, aquatic snails, crayfishes, and fishes. Our goals were to determine species presence, distribution, relative abundance, and relative health. Due to time constraints, we focused most efforts toward surveys of rare species. Figure 1 and Table 1 detail the localities of all sites surveyed. Most of the streams surveyed were tannic, with higher velocities occurring in northwestern streams and more swampy slack conditions in southeastern streams. Depth varied from very shallow to moderately deep (mostly shallow to moderate), and widths ranged from 3 to 25 m, with the exceptions of Neuse River, which was much wider. Percent cover over streams was greater than 50% for about half of streams surveyed. Stream substrate consisted of varying amounts of silt, cobble, pebble, gravel, boulder, clay, and sand in the northwestern streams and large rivers, and substrate in the southeastern streams consisted of the same components and also a high degree of mud, detritus, and vegetation. Bank height was generally very low (most less than 1 m), and banks were mostly stable with some undercutting. Buffer widths were narrow to wide, and riparian vegetation consisted of mostly trees and shrubbrush with some grass or marsh plants. Woodland area surrounding streams was generally intermediate or not extensive with low to moderate amounts of windthrow. Approximately onethird of the surrounding area was natural, and the other two-thirds consisted of rural or urban housing, cropland or pasture, and a significant amount of timber cuts of various ages. The following sections provide results of the aquatic inventory for each of the taxa mentioned above.

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Methods

A total of 28 sites were surveyed during this study (May through November 2001) (Table 1, Figure 1). Sites were usually accessed at bridge crossings, and we walked upstream (-) or downstream (+) for distances ranging from 50 to 400m. At some sites, we canoed stretches from bridge crossing to bridge crossing. Visual estimates of substrate composition, average stream width, average depth, bank height and stability, width and composition of the riparian buffer, and any other relevant site characteristics were recorded at each site. Map locations in latitude/longitude were acquired using Garmin 12 XL or Trimble GeoExplorer Global Positioning System units. Both bivalve and gastropod mollusks were observed or collected during visual, dipnet, and tactile searches of the streambed. Gastropod mollusks and sphaeriid clams also were observed or collected during visual, dipnet, and tactile searches of aluminum cans, bottles, and other anthropogenic materials, woody debris, leaf packs, and aquatic plants. Live freshwater mussels were identified, measured, and returned to the stream. Shell material was retained if in suitable condition for museum collections. The presence or absence of Corbicula fluminea was noted. Crayfishes and fishes were collected by dipnet, overturning rocks, and/or using a backpack electroshock unit. Specimens that were not identified in the field were preserved in 70% to 95% ethanol for later identification.

Aquatic Snail and Pea Clam Results & Discussion

Of the 28 sites surveyed, 23 were surveyed in some manner for aquatic snails and they were collected or observed at 22 localities (Table 2). Site 2 was predominantly surveyed for mussels, while sites 6, 8, 12, and 25 were predominantly surveyed for crayfish and fish and are excluded from the results reported herein. At least 9 species representing 7 families were documented during the Johnston County aquatic inventory: Campeloma decisum (pointed campeloma), Elimia catenaria (gravel elimia), Ferrissia sp., Helisoma anceps (two-ridge rams-horn), Hydrobiidae (hydrobiid), Laevapex fuscus (dusky ancylid), Micromenetus dilatatus (bugle sprite), Physella sp. (physa snail), and Pseudosuccinea columella (mimic lymnaea). Presently, there are no known rare or endangered aquatic snails that occur in Johnston County (LeGrand, Jr. et al. 2001). No one species dominated the waterways, but Physella sp. was the most common and widespread gastropod, residing at 15 sites. Other common species included Hydrobiidae and M. dilatatus, both residing at 11 sites. The remaining snail species were represented at a smaller number of sites, ranging from 2-9. Abundance estimates for each species were usually not determined due to time constraints, but where they were, most species were uncommon to common. Recent reproduction was seen at a number of sites for most of the snail species collected during the survey, but varied widely depending on the species. Due to the minute size of some of the species (e.g., Micromenetus dilatatus and Hydrobiidae) it was difficult to confirm whether these were adults or juveniles and typically, reproduction was not recorded. Additional sites and information for historical records are noted in Table 3.

Over the same time period and at 25 of the 28 sites, freshwater clams were collected or observed at 24 localities (Table 2). Site 2 was surveyed predominantly for mussels, while sites 6 and 8 were surveyed predominantly for fish and crayfish and are excluded from the results reported herein. Eight species of freshwater clams were documented during the Johnston County aquatic inventory: *Musculium partumeium* (swamp fingernailclam), *M. securis* (pond fingernailclam), *Pisidium adamsi* (Adam peaclam), *P. casertanum* (ubiquitous peaclam), *P. dubium* (greater

eastern peaclam), P. equilaterale (round peaclam), Sphaerium striatinum (striated fingernailclam), and the exotic Corbicula fluminea (Asian clam). Presently, there are no known rare or endangered freshwater clams that occur in North Carolina (LeGrand, Jr. et al. 2001). Of the 24 sites where clams were collected, the Asian clam was present at 14 localities and was the only clam noted at 10 of these sites. The swamp fingernailclam occupied at least 6 sites (most likely 10 sites with the addition of Musculium sp. specimens) and was the sole sphaeriid clam at 3 (or 6) of those sites. The remaining sphaeriids were present at only 1 to 4 sites. Like the gastropods, abundance estimates were typically not recorded but when they were, they ranged from abundant to rare. Evidence of reproduction was variable as well depending on the species. Additional sites and information for historical records are noted in Table 3.

Overall, the diversity and abundance of freshwater snails in the waterways associated with Johnston County is fair. The number of species is moderate when compared to surveys conducted in other parts of the state, but the overall distribution of these species is comparatively low. Unlike the snail fauna, we collected a relatively high number of pea clam species when compared to previous surveys in other parts of the state. Given the number of unsurveyed streams and the presence of larger streams and rivers like the Neuse and Little rivers and Swift Creek, we suspect that the number of pea clam and snail species is likely higher.

The influence of geomorphologic and topographic factors has most likely structured the current gastropod and sphaeriid fauna of the area. Major landscape scale factors such as these are known to influence and impact the distribution and abundance of organisms over time. While water chemistry parameters were not measured at the surveyed sites, cumulative impacts from poor land uses could be affecting the quality of the waterways. The presence of agriculture and logging operations within close proximity to some of the surveyed water bodies has most likely had a negative impact on stream quality through animal waste infiltration and sedimentation, respectively. While these impacts may not have had a significant effect on the current aquatic snail and clam diversity, they are likely affecting the current abundance and distribution of each species. Effects from urbanization also are likely present due to the 50% population increase since 1990.

Taxonomic uncertainties within the freshwater snail fauna make the results here subject to revision. For example, the differentiation between F. rivularis and F. fragilis is difficult due to shell shape variation. Therefore, a common factor used to distinguish these species is the habitat they are collected in, with F. rivularis colonizing rivers and streams and F. fragilis inhabiting stagnant areas such as ditches, ponds, and backwater areas. All of the limpets identified as Ferrissia during this survey were identified to genus only, but it is possible that at least both species inhabit some of the sites that were surveyed. Likewise, many uncertainties exist as to the taxonomy of Physella and hydrobiids without examination of soft parts (Burch 1989). Since we did not preserve the specimens for the examination of soft parts, we identified these specimens to genus only.

The collection of *Pisidium equilaterale* was a significant find, as it has never been previously documented in North Carolina (G.L. Mackie, University of Guelph, pers. comm.). The historical range of the species is described as occupying southeastern Canada to eastern Lake Superior, extending south to Virginia, Pennsylvania and Illinois (Burch 1975). While no additional rare or

significant snail or pea clam species were collected during the survey of Johnston County, continual research and status surveys are needed to clarify the status of a number of these species. Current land management practices, including agriculture and urbanization, are having an effect on the snail and pea clam fauna in North Carolina. As nongame biologists, we need to identify which species are at risk and identify ways to reduce or eliminate impacts.

Freshwater Mussel Results & Discussion

At least 19 species of freshwater mussel have been documented from the waters of Johnston County, North Carolina. Two of these, Alasmidonta heterodon and Elliptio steinstansana, are federal endangered species; 4 others are state endangered, and 4 are state threatened. Eleven of these species were observed during 2001 aquatic surveys of Johnston County (Table 2). One state endangered species: Elliptio lanceolata (status change effective July 1, 2002; LeGrand, Jr. et al. 2001), and three state threatened species: Alasmidonta undulata, E. roanokensis, and Lampsilis radiata (status change effective July 1, 2002) were found in these surveys (Figures 2a,b, and c). Seven additional species were found including Pyganodon cataracta, Elliptio complanata complex, E. icterina complex, E. congaraea, E. cistelliformis, E. viridula, and a lanceolate elliptio. North Carolina populations of P. cataracta are considered currently stable. The conservation status of the remaining elliptio species is undetermined at this time, primarily due to taxonomic uncertainty within the genus. Due to this uncertainty, some specimens were identified as E. cistelliformis based on shell characteristics rather than E. complanata complex.

Elliptio complanata complex and E. icterina complex (also recorded as Elliptio spp.) were the most commonly encountered native mussels, found in 5 systems: Black Creek, Middle Creek, and Swift Creek, Little River, and the main channel Neuse River. These species have previously been documented from 7 other systems: White Oak Creek, Little Creek, Hannah Creek, Mill Creek, Copper Branch, Cattail Creek, and Buffalo Creek. Alasmidonta undulata and E. roanokensis were found in 2 systems: Swift Creek and the Little River. A. undulata has been previously documented from 2 other systems: Middle Creek and Buffalo Creek. E. roanokensis has also been found in 2 other systems: Neuse River and Mill Creek. Lampsilis radiata, Elliptio viridula, and Pyganodon cataracta were found in the Little River. L. radiata was previously documented in 3 other systems: Swift Creek, Middle Creek, and Mill Creek. Documentation of the presence of E. viridula is complicated by taxonomic uncertainties within the genus however previous records of lanceolate elliptio species exist for 5 additional systems: Mill Creek, Middle Creek, Swift Creek, Cattail Creek, and Buffalo Creek. P. cataracta has been observed in three additional systems: Middle Creek, Swift Creek, Swift Creek, and White Oak Creek. Elliptio lanceolata was found only in Swift Creek. This species has been previously documented from Middle Creek, Mill Creek and the Little River.

As noted above, records exist for eight additional species in Johnston County (Table 3). Extensive surveys of the Swift Creek and Little River subbasins have been undertaken in recent years and many records were produced in these earlier surveys. *Alasmidonta heterodon* has been found in 5 systems: Little River, Buffalo Creek, Swift Creek, Middle Creek, and White Oak Creek. Records of *Utterbackia imbecillis* come from 4 systems: Moccasin Creek, Little River, Swift Creek, and White Oak Creek. *Fusconaia masoni* and *Strophitus undulatus* have been documented from 3 systems: Middle Creek, Swift Creek, and the Little River. *Villosa constricta* has been found in the Little River and Swift Creek. There are records of *Elliptio steinstansana*

and Lampsilis cariosa from the Little River and Lasmigona subviridis was found in Swift Creek. The Little River population of E. steinstansana is the only known occurrence of this species outside of the Tar River Basin.

The most diverse mussel fauna observed in 2001 surveys was in the Little River with 8 species: Alasmidonta undulata, Elliptio complanata complex, E. icterina complex, E. roanokensis, E. viridula, lanceolate elliptio, Lampsilis radiata, and Pyganodon cataracta (Table 2). The record for E. roanokensis is new for this system. Seven other species have been recorded from the Little River in Johnston Co.: A. heterodon, E. steinstansana, Fusconaia masoni, L. cariosa, Strophitus undulatus, Utterbackia imbecillis, and Villosa constricta (Table 3). Lasmigona subviridis is also known from the Little River within Wake County. Buffalo Creek, a tributary of the Little River, supports 6 species including A. heterodon. The total known freshwater mussel diversity for the Little River Subbasin is 16 species.

Swift Creek has the second most diverse mussel fauna in the county with 6 species recorded in 2001 surveys: Alasmidonta undulata, Elliptio complanata, E. congaraea, E. icterina complex, E. lanceolata, and E. roanokensis (Table 2). An additional 9 species have been recorded from Swift Creek and its tributaries in previous surveys: A. heterodon, Strophitus undulatus, Lampsilis radiata, Fusconaia masoni, Utterbackia imbecillis, Pyganodon cataracta, Lasmigona subviridis, Villosa constricta, and lanceolate elliptio (Table 3). Total known freshwater mussel diversity in the Swift Creek Subbasin is 15 species.

Despite extensive habitat degradation in Johnston County, the Neuse River continues to support several species of freshwater mussels. Recent surveys at NC 42 and through the Let 'Lones area produced records of Alasmidonta undulata, Strophitus undulatus, E. complanata complex, E. congaraea, E. icterina complex, E. roanokensis, and Lampsilis radiata (J.M. Alderman, NCWRC, personal communication and Table 3).

Crayfishes Results & Discussion

The overall diversity of crayfishes in this system was fair, containing at least 5 native species collected during our inventory: Cambarus (Depressicambarus) latimanus (LeConte, 1856), Cambarus (Puncticambarus) sp. C (a member of a species complex related to Cambarus (P.) acuminatus Faxon, 1884 that is currently being described by J.E. Cooper, NC State Museum of Natural Sciences), Orconectes (Procericambarus) carolinensis Cooper and Cooper, 1995, Procambarus (Ortmannicus) acutus (Girard, 1852), and a species that is either P. (O.) medialis Hobbs, 1975, P. (O.) plumimanus Hobbs and Walton, 1958, or an undescribed relative. Orconectes carolinensis is state listed special concern, and Procambarus medialis and P. plumimanus are on a watch list in North Carolina (statuses effective 1 July, 2002; LeGrand, Jr. et al. 2001). The conservation statuses of the other two native species are considered stable throughout their ranges.

Procambarus acutus was well distributed throughout the surveyed areas, occurring at 18 sites (Table 2), and ranged from uncommon to common in abundance at each site. Cambarus latimanus, C. sp. C, Orconectes carolinensis, and Procambarus medialis/plumimanus were less well distributed, occurring at only 3, 4, 2, and 1 sites, respectively (Table 2, Figure 2). Cambarus latimanus and Orconectes carolinensis were each historically collected from 1

additional site, and *Procambarus medialis* was collected from 2 additional sites historically. *Procambarus acutus* was the only species to occur alone (14 sites). *Cambarus* sp. C and *P. medialis/plumimanus* occurred only with *P. acutus*, and *Cambarus latimanus* occurred with *P. acutus* and *Orconectes carolinensis*. No crayfish were collected at 4 sites. Abundances of the less widespread species were uncommon except *P. medialis/ plumimanus*, which was fairly common, although patchy, at the site where it was collected. Recent reproduction was evident for all species. Carapace lengths (mm) for each species are as follows (mean \pm SD, min, max, in mm): *C. latimanus*: 7.0 ± 0.9 , 5.9, 9.0; *C.* sp. C.: 22.1 ± 7.7 , 17.0, 31.0; *O. carolinensis*: 22.5 ± 3.9 , 17.0, 31.0; *P. acutus*: 15.1 ± 7.7 , 6.0, 44.2; *P. medialis/ plumimanus*: 18.7 ± 4.6 , 8.5, 22.1. *Palaemonetes paludosus* (freshwater shrimp) was also collected from 18 sites.

During our survey, we found 5 of the 9+ native species historically known to occur in the Neuse River Basin. At least 4 species that we did not find, but that occur in this river basin, are Cambarus (Cambarus) davidi Cooper, 2000, C. (D.) reduncus Hobbs, 1956, C. (Lacunicambarus) diogenes Girard, 1852, and Fallicambarus (Creaserinus) fodiens (Cottle, 1863). Cambarus davidi and C. reduncus occur farther upstream in this river basin, and may not occur in the area where our survey was conducted. These 2 species, as well as Cambarus diogenes and F. fodiens, are burrowing species and may occur in the area but our survey did not use methods designed to find burrowers. This inventory has helped to establish the continued presence of several rare species in the area, and further clarify distribution boundaries of several species in the Neuse River Basin.

Fishes Results & Discussion

Of the 28 sites surveyed, 25 were surveyed in some manner for freshwater fishes, and they were collected or observed at all 25 localities (Table 2). Sites 2, 5a-d, and 22a-h were predominantly surveyed for mussels and are excluded from the results reported herein. Forty-five species representing 15 families were documented during the Johnston County aquatic inventory (Table 4). No new species records were noted for the 74 species that have been documented in Johnston County (Menhinick 1991; NC State Museum of Natural Sciences, pers. com.). Limitations as to our access of all available habitats and sampling range within the county were the most likely reasons for the absence of particular species and limited species' range and abundance. Overall, the waterways of Johnston County contain a moderate to high diversity of fish species given its location within both the Piedmont and Coastal Plain, and the presence of large rivers and streams such as the Neuse and Little rivers and Swift Creek. It is possible though that effects from urbanization are impacting this diversity since Johnston County has seen a 50% population increase since 1990. The ability of the county to maintain much of its rural character and preserve open space may have limited these impacts in some areas. Comparisons to other inventories of the county are limited due to the lack of recent surveys. However, our comparisons to Menhinick (1991) reflect that the species composition reported herein is representative of the area.

For purposes of this report, *Etheostoma nigrum* (johnny darter) and *E. olmstedi* (tessellated darter) specimens were identified together (Table 4). The fall line typically represents the divide between the 2 species with the johnny darter to the north and the tessellated darter to the south, but there is an area of intermixing between the species. Since we did not preserve specimens for laboratory identification and the only way to truly differentiate the species is to examine

individuals for a complete or incomplete infraorbital canal after applying a dye, we could not provide a definite identification for each specimen.

Significant species found during the survey include Lythrurus matutinus (pinewoods shiner), which is currently noted as a significantly rare species by the Natural Heritage Program and is a federal species of concern (LeGrand, Jr. et al. 2001). Specimens of the pinewoods shiner were collected from 2 sites on each Swift Creek and Little River. Historically, this species has been noted in both of these waterways (Menhinick 1991), so it appears that these populations may still However, quantitative surveys need to be conducted to clearly determine the pinewoods shiner's stability within the county. Likewise, the Neuse River Basin population of Noturus furiosus (Carolina madtom) is currently state listed special concern (LeGrand, Jr. et al. 2001) and has been historically documented within Johnston County (Menhinick 1991, Burr and Lee 1985). However, we surveyed 10 sites at these or proximal locations within the same waterways and no Carolina madtom specimens were collected or seen. Given the urbanization impacts that have been ongoing in Wake County over the past few decades and the 50% population increase in Johnston County over the past decade, it is probable that the relatively sensitive and specialized Carolina madtom has been negatively impacted leading to a significant decline in its population numbers and distribution. Since this species is endemic to the Neuse River and Tar River basins and the Little River was noted as harboring the largest extant population within the entire Neuse River Basin (Burr and Lee 1985), any significant decline in this subpopulation could be devastating for the future success and survival of the species.

While no additional threatened or endangered fish species was collected during the survey of Johnston County, continual research and status surveys are needed to determine the present status of each species. Current land management practices, including agriculture and urbanization, are having an effect on the fish fauna in North Carolina. As nongame biologists, we need to identify, which species are at risk and identify ways to reduce or eliminate the impacts.

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Table 1. Map numbers and corresponding sites surveyed for the Johnston County aquatic inventory, 2001 (see Figure 1). Records of animals observed at each site are detailed in Table 2, and those collected historically (prior to 2001; sites not listed here) are detailed in Table 3.

Waterway @ Road	Site no.	Map#
Bawdy Creek @ SR 2523	011016.5ahf, 011128.5btw	20
Black Creek @ NC 210	011119.1jaj	2
Black Creek @ SR 1309	011025.3ahf, 011102.2btw	3
Black Creek @ SR 1330	011017.6ahf, 011102.3btw	13
Buffalo Creek @ NC 39	011016.2ahf, 011105.4btw	24
Buffalo Creek @ SR 1700	011016.1ahf	23
Hannah Creek @ SR 1150	011017.4ahf, 011128.2btw	15
Hannah Creek @ SR 1159	011017.5ahf, 011128.1btw	14
Little Creek @ SR 1562	011025.6ahf, 011105.3btw	7
Little River @ NC 96	010530.1-4jaj, 010531.1-4jaj	22a-h
Little River @ SR 1002	010828.1-4jaj, 010828.1btw	28a-e
Little River @ SR 1934	011016.3ahf	26
Little River @ SR 2130	011105.5btw	25
Little River @ SR 2320	010725.1-6jaj, 010828.2btw	27a-g
Middle Creek @ NC 210	011025.1ahf, 011102.5btw	9
Middle Creek @ NC 50	011025.4ahf, 011102.1btw	1
Middle Creek @ SR 1504	011102.4btw	12
Middle Creek @ SR 1507	011025.2ahf	11
Mill Creek @ SR 1124	011017.1ahf	16
Mill Creek @ SR 1185	011017.3ahf, 011128.4btw	18
Mill Creek @ SR 1201	011016.6ahf	21
Polecat Branch @ SR 1007	011016.4ahf, 011128.6btw	19
Stone Creek @ SR 1138	011017.2ahf, 011128.3btw	17
Swift Creek @ NC 210	010802.2btw	10
Swift Creek @ SR 1501	011128.7btw	8
Swift Creek @ SR 1525	011025.5ahf, 011105.1btw	4
Swift Creek @ SR 1555 to SR 1643	010921.1-4jaj	5a-d
Swift Creek @ SR 1562	011105.2btw	6

Records where "none" was recorded indicate that no animals were observed during the search period, but does not necessarily mean that animals do not occur at the site. Substrates, where given, are defined as follows, with dominant substrates capitalized: b=bedrock, b=boulder, Table 2. Freshwater mussels, clams, crayfishes, limpets, snails, and fishes found during the aquatic inventory of Johnston County, 2001. c=clay, co=cobble, d=detritus, g=gravel, m=mud, p=pebble, r=roots, s=silt, sa=sand, v=vegetation.

ocation Site (date) and species	Substrate	Technique	Search Time	# Live	# Live # Shells
Bawdy Creek @ SR 2523					
011016.5ahf none (n/a)	u,b,s	dipnet/visual	ڃ		
crayfish					
011016.5ahf Cambarus (Depressicambarus) latimanus (n/a)	m'p's	dipnet	prod passes	S	
011016.5ahf Procambarus (Ortmannicus) acutus (White River crayfish)	m'p's	dipnet	T.	15	
fish					
011016.5ahf Aphredoderus sayanus (pirate perch)	m,b,s	dipnet	Æ		
011016.5ahf Chologaster comuta (swampfish)	s,d,m	dipnet	2	7	
011016.5ahf Elassoma zonatum (banded pygmy sunfish)	ut, p's	dipnet	-		
011016.5ahf Enneacanthus gloriosus (bluespotted sunfish)	m,b,s	dipnet	lang Marke Years	m	
011016.5ahf Etheostoma serrifer (sawcheek darter)	m,b,s	dipnet	,Ci	S	
011016.5ahf Gambusia holbrookii (eastern mosquitofish)	m'p's	dipnet	무		
011016.5ahf Microplerus salmoides (largemouth bass)	m,b,s	dipnet	Ŧ.	Ases	
011016.5ahf Umbra pygmaea (eastern mudminnow)	s,d,m	dipnet	and the same of th	S	
snail 011016.5ahf Physella sp. (physa snail)	m,b,s	dipnet/visual	_=	m	
Bawdy Creek @ SR 2523-					
fish					
011128.5btw Aphredoderus sayanus (pirate perch)		electroshock	328s	2	
011128.5btw Chaenobryttus gulosus (warmouth)		electroshock	328s	found	
011128.5btw Enneacanthus gloriosus (bluespotted sunfish)		electroshock	328s	4	
011128.5btw Etheostoma serrifer (sawcheek darter)		. electroshock	328s	pa-4	
011128.55tw Lepomis gibbosus (pumpkinseed)		electroshock	328s	perod	
011128.5btw Lepomis macrochirus (bluegill)		electroshock	328s	4	
011128.5btw Notemigonus crysoleucas (golden shiner)		electroshock	328s	-	
011128.5btw Umbra pygmaea (eastern mudminnow)		electroshock	328s	2	

Location		40.48	Search		
Site (date) and species	Substrate	Technique	Time	# Live #S	# Shells
Black Creek @ NC 210					
mussel					
011119.1jaj Elliptio spp. (n/a)	c,s,Sa	tactile	0.17h	01	
Black Creek @ SR 1309					
clam					
011025.3ahf Musculium partumeium (swamp fingernailelam)	s,c,D,m	dipnet	ч	9	
011025.3ahf Musculium securis (pond fingemailclam)	s,c,D,m	dipnet	Пh		
crayfish					
011025.3ahf none (n/a)	s,c,D,m	dipnet	Ч		
fish					
011025.3ahf Ameiurus natalis (yellow bullhead?)	s,c,D,m	dipnet	11	-	
011025.3ahf Chologaster cornuta (swampfish)	s,c,D,m	dipnet	Пh	9	
011025.3ahf Elassoma zonatum (banded pygmy sunfish)	s,c,D,m	dipnet	Пh	10	
011025.3ahf Enneacanthus gloriosus (bluespotted sunfish)	s,c,D,m	dipnet	1h	3	
011025.3ahf Etheostoma fusiforme (swamp darter)	s,c,D,m	dipnet	Ιh	-	
011025.3ahf Etheostoma scrrifer (sawcheek darter)	s,c,D,m	dipnet	1h	6	
011025.3ahf Gambusia holbrookii (eastern mosquitofish)	s,c,D,m	dipnet	1h		
shrimp			:		
011025.3ahf Palacmonetes paludosus (freshwater shrimp)	s,c,D,m	dipnet	Ч		
snail					
011025.3ahf Campeloma decisum (pointed campeloma)	s,c,D,m	dipnet	Пh		
011025.3ahf Micromenetus dilatatus (bugle sprite)	s,e,D,m	dipnet	Ih	-	
011025.3ahf Physella sp. (physa snail)	s,c,D,m	dipnet	1h		
011025.3ahf Pseudosuccinea columella (mimic lymnaea)	s,c,D,m	dipnet	H.		
Black Creek @ SR 1309-					
fish					
011102.2btw Anguilla rostrata (American eel)		electroshock	\$665	_	
011102.2btw Aphredoderus sayanus (pirate perch)		electroshock	\$66S	3	
011102.2btw Centrarchus macropterus (flier)		electroshock	599s	_	
011102.2btw Enneacanthus gloriosus (bluespotted sunfish)		electroshock	599s	2	
011102.2btw Erimyzon oblongus (creek chubsucker)		clectroshock	S665		
011102.2btw Esox americanus (redfin pickerel)		electroshock	\$665	_	
011102.2btw Etheostoma fusiforme (swamp darter)		electroshock	866S	_	
011102.2btw Gambusia holbrookii (eastern mosquitofish)		electroshock	866S		
011102.2btw Lepomis macrochirus (bluegill)		electroshock	866\$	3	

Location Site (date	ition Site (date) and species	Substrate	Technique	Search e Time	#Live #Shells	ells
<u>snail</u> 011102.2btw	snail 011102.2btw Campeloma decisum (pointed campeloma)		dipnet/visual		-	
Black Creek @ SR 1330	<u> </u>					
<i>clam</i> 011017.6ahf	<u>clam</u> 011017.6ahf Corbicula fluminea (Asian clam)	s,sa,C,PP,v,d,m	dipnet/visual	0.83h		
crayfish 011017.6ahf	<u>crayfish</u> 011017.6ahf Procambarus (Ortmannicus) acutus (White River crayfish)	s,sa,C,PP,v,d,m	dipnet/visual	0.83h	3	
fish	fish (1017 Cate Anthrododone concerns (minte monets)	m p n dd J es s	dinne	0.83h		
011017,6ahf	011017.6ahf Elassoma zonatum (banded pygmy sunfish)	s,sa,C,PP,v,d,m	dipnet	0.83h	ž.	
011017.6ahf	011017.6ahf Enneacanthus gloriosus (bluespotted sunfish)	s,sa,C,PP,v,d,m	dipnet	0.83h		
011017.6ahf	011017.6ahf Etheostoma serrifer (sawcheek darter)	s,sa,C,PP,v,d,m	dipnet	0.83h		
011017.6ahf	011017.6ahf Gambusia holbrookii (eastern mosquitofish)	s,sa,C,PP,v,d,m	dipnet	0.83h		
011017.6ahf	011017.5ahf Noturus sp. (margined or tapole madtom)	s,sa,C,PP,v,d,m	dipnet	0.83h		
011017.6ahf	011017.6ahf Umbra pygmaea (eastern mudminnow)	s,sa,C,PP,v,d,m	dipnet	0.83h		
mussel 011017.6ahf	mussel 011017.6ahf Elliptio complanata (eastern Elliptio)	s,sa,C,PP,v,d,m	dipnet/visual	0.83h		2
shrimp 011017.6ahf	<u>shrimp</u> 011017.6ahf Palaemonetes paludosus (freshwater shrimp)	s,sa,C,PP,v,d,m	dipnet	0.83h		
snail 011017 6ahf	<u>snail</u> 011017 fahf Physella sn (nhysa snail)	s.sa.C.PP.v.d.m	dipnet	0.83h		
011017.6ahf	011017.6ahf Pseudosuceinea columella (minuic lymnaea)	s,sa,C,PP,v,d,m	dipnet	0.83h	2	2
Black Creek @ SR 1330.	@ SR 1330-					
lish						
011102.3btw	011102.3btw Amia calva (bowfin)		electroshock	577s	_	
011102.3btw	011102.3btw Anguilla rostrata (American eel)		electroshock		_	
011102.3btw	Aphredoderus sayanus (pirate perch)		electroshock	577s	2	
011102.3btw	Centrarchus macropterus (flier)		electroshock	S77s	-	
011102.3btw	Erimyzon oblongus (creek chubsucker)		electroshock			
011102.3btw	Esox americanus (redfin pickerel)		electroshock		4	
011102.3btw	Gambusia holbrookii (eastern mosquitofish)		electroshock			
011102.3btw	Lepomis auritus (redbreast sunfish)		electroshock		3	
011102.3btw	Lepomis gibbosus (pumpkinseed)		electroshock		2	
011102.3btw	Lepomis macroehirus (bluegill)		electroshock		e	
011102.3btw	Umbra pygmaea (eastern mudminnow)		electroshock	S77s	-	

Location	21.4.1.4	Search	L		# CF . 112	
Site (date) and species	Substrate	I ecunique	1 Ime	# Live	# Suells	
mussel						
011102.3btw Elliptio complanata (eastern Elliptio)		visual			2	
snail						
011102.3btw Pseudosuccinea columella (mimic lymnaea)		visual		-		
Buffalo Creek @ NC 39						
land						
011016 2ahf Corbicula fluminea (Asian clam)	M.b.v.e.s.S	dipnet	౼			
011016 Joht Musculium en (nartumeium?) (n/a)	Mbyes	dipnet	4			
Ollorozanii Museanani sp. (partanicianii) (rea)	W C C O	to anit	: =			
011016.Zahi Pistium casenanum (noiquitous peaciam)	S,584,V,U,IVI	upnet	≘		i.	
UTIVIO.Zani Fisivium equilaterale (Tourn Peaciain)	5,5d,V,U,IVI	roudin	:			
crayfish	:	:) :	:		
011016.2ahf Proeambarus (Ortmannicus) acutus (White River crayfish)	S,sa,v,d,M	dipnet	<u>=</u>	=		
$f_{\overline{0}Sh}$						
011016.2ahf Aphredoderus sayanus (pirate perch)	S,sa,v,d,M	dipnet	I.	-		
011016.2ahf Chaenobryttus gulosus (warmouth)	S,sa,v,d,M	dipnet	П	_		
011016.2ahf Enneacanthus gloriosus (bluespotted sunfish)	S,sa,v,d,M	dipnet	Пĥ	_		
011016.2ahf Etheostoma serrifer (sawcheek darter)	S,sa,v,d,M	dipnet	1h	-		
011016.2ahf Gambusia holbrookii (eastern mosquitofish)	S,sa,v,d,M	dipnet	Ή			
011016.2ahf Notropis procne (swallowtail shiner)	S,sa,v,d,M	dipnet	ΙΉ			
limpet						
011016.2ahf Laevapex fuscus (dusky ancylid)	S,sa,v,d,M	dipnet	H.			
shrimp 011016.2ahf Palaemonetes naludosus (freshwater shrimo)	S.sa.v.d.M	dipnet	£			
(Amusic commisses) encountries of commisses of the commis						
011016.2ahf Campeloma decisum (pointed campeloma)	S,sa,v,d,M	dipnet	£	9		
011016.2ahf Helisoma anceps (two-ridge rams-horn)	S,sa,v,d,M	dipnet	1 1	2		
011016.2ahf Hydrobiidae (hydrobiid)	S,sa,v,d,M	dipnet	표			
011016.2ahf Micromenetus dilatatus (bugle sprite)	S,sa,v,d,M	dipnet	1h	-		
011016.2ahf Physella sp. (physa snail)	S,sa,v,d,M	dipnet	H.	3		
011016.2ahf Pseudosuccinea columella (mimic lymnaca)	S,sa,v,d,M	dipnet	П	-		
Buffalo Creek @ NC 39+						
<u>fish</u>						
011105.4btw Ameiurus platycephalus (flat bullhead)		electroshock	323s	_		
011105.4btw Anguilla rostrata (American eel)		electroshock	323s	-		
011105.4btw Erimyzon oblongus (creek chubsucker)		electroshock	323s	2		
011105.4btw Gambusia holbrookii (eastern mosquitofish)		electroshock	323s	_		
011105.4btw Lepomis auritus (redbreast sunfish)		clectroshock	323s			
	-					

Location Site (date) and species	Substrate	Search Technique	Time	# Live # Shells	IS
mussel 011105.4btw Elliptic cistelliformis (box spike)		visual		_	
shrimp 011105.4btw Palaemonetes paludosus (freshwater shrimp)		electroshock	323s		
Buffalo Creek @ SR 1700					
<u>clam</u> 011016.1ahf Museulium partumeium (swamp fingernailclam)	M,b,v,s	dipnet	"Cii post		
<u>crayfish</u> 011016.1ahf Procambarus (Ortmannicus) acutus (White River crayfish)	W,b,v,s	dipnet	4	\$	
$\frac{\partial h}{\partial x}$				ė,	
011016.1ahf Chaenobryttus gulosus (warmouth)	W,b,v,s	dipnet	Ч		
011016.1ahf Etheostoma fusiforme (swamp darter)	W,b,v,s	dipnet	<u>_</u>		
011016.1ahf Gambusia holbrookii (eastern mosquitofish)	M,b,v,s	dipnet	Пh		
011016.1ahf Lepomis macrochirus (bluegill)	M,b,v,s	dipnet	1h		
<u>limpet</u> 011016.1ahf Laevapex fuscus (dusky ancylid)	M,b,v,s	dipnet	4		
<u>shrimp</u> 011016.1ahf Palaemonetes paludosus (freshwater shrimp)	M,b,v,s	dipnet	Пh		
Suail 011016 1016 Commeloum decisium (nainted commeloums)	V	dinne	=	ç	
011016 lahf Hydmhiidae (hydrobiid)	W.D.A.S	dipnet	: ч	a.	
011016.1ahf Micromenetus dilatatus (bugle sprite)	W,b,v,s	dipnet	1h		
011016.1ahf Physella sp. (physa snail)	W,b,v,s	dipnet	11	. 3	
011016.1ahf Pseudosuccinea columella (mimic lymnaea)	M,b,v,s	dipnet	чı	8	
Hannah Creek @ SR 1150					
011017.4ahf Musculium sp. (n/a)	s,C,v,d,m	dipnet	4		
<u>crayfish</u>011017.4ahf Procambarus (Ortmannicus) acutus (White River crayfish)	s,C,v,d,m	dipnet/visual	ų	∞	
fish 011017.4ahf Aphredoderus savanus (birate perch)	s.C.v.d.m	dipnet	ä		
011017.4ahf Elassoma zonatum (banded pygmy sunfish)	s,C,v,d,m	dipnet	르		
011017.4ahf Etheostoma fusiforme (swamp darter)	s,C,v,d,m	dipnet	1h	3	
011017.4ahf Etheostoma serrifer (sawcheek darter)	s,C,v,d,m	dipnet	1h	_	

Location Site (date) and species	Substrate	Technique	Search Time	# Live	# Shells	
fish						
011017.4ahf Lepomis auritus (redbreast sunfish)	s,C,v,d,m	dipnet	H.	-		
011017.4ahf Noturus gyrinus (tadpole madtom)	s,C,v,d,m	dipnet	묘	4		
011017.4ahf Umbra pygmaca (eastern mudminnow)	s,C,v,d,m	dipnet	묘	2		
<u>mussel</u> 011017.4ahf lanceolate Elliptio (lance)	s,C,v,d,m	visual	Пĥ	S		
<u>shrimp</u> 011017.4ahf Palaemonetes paludosus (freshwater shrimp)	s,C,v,d,m	dipnet/visual	.			
<u>snail</u> 011017.4ahf Hydrobiidae (hydrobiid)	s,C,v,d,m	dipnet	恒			
011017 4ahf Physella sp. (physa snail)	s,C,v,d,m	dipnet/visual	ᄪ			
Hannah Creek @ SR 1150-						
<u>crayfish</u>						
011128.2btw Burrow(s) (n/a)		visual				
011128.2btw Procambarus (Ortmannicus) acutus (White River crayfish)		electroshock	375s			
fish.						
011128.2btw Anguilla rostrata (American eel)		electroshock	375s			
011128.2btw Aphredoderus sayanus (pirate perch)		electroshock	375s	3		
011128.2btw Chaenobryttus gulosus (warmouth)		electroshock	375s	2		
011128.2btw Elassoma zonatum (banded pyginy sunfish)		electroshock	375s	-		
011128.2btw Erimyzon oblongus (creek chubsucker)		electroshock	375s	4		
011128.2btw Etheostoma serrifer (sawcheek darter)		electroshock	375s	-		
011128.2btw Lepomis auritus (redbreast sunfish)		electroshock	375s	-		
011128.2btw Lepomis macrochirus (bluegill)		electroshock	375s	S		
<u>shrimp</u> 011128.2btw Palaemonetes paludosus (freshwater shrimp)		electroshock	375s			
Hannah Creek @ SR 1159						
011017,5ahf Musculium partumeium (swamp fingernailclam)	s.sa,C.d.m	dipnet/visual	프			
011017.5ahf Pisidium adamsi (Adam peaclam)	s,sa,C,d,m	dipnet/visual	H			
crayfish 011017.5ahf Procambarus (Ortmannicus) acutus (White River erayfish)	s,sa,C,d,m	dipnet/visual	=	∞	0	
fish.						
011017,5ahf Aphrododerus sayanus (pirate perch) 011017,5ahf Elassoma zonatum (bandod pygmy sunfish)	s,sa,C,d,m s,sa,C,d,m	dipnet dipnet	= =	9		

Location				Search		
Site (d	Site (date) and species	Substrate	Technique	Time	# Live # Shells	rells
fish						
011017.5a	011017.5ahf Esox americanus (redfin pickerel)	s,sa,C,d,m	dipnet	H.	-	
011017.5ahf	thf Etheostoma fusiforme (swamp darter)	s,sa,C,d,m	dipnet	1h	2	
011017.5ahf	thf Etheostoma serrifer (sawcheek darter)	s,sa,C,d,m	dipnet	lh I	10	
011017.5a	011017.5ahf Gambusia holbrookii (eastern mosquitofish)	s,sa,C,d,m	dipnct	ų.		
011017.Sa	011017.5ahf Umbra pygmaea (eastern mudminnow)	s,sa,C,d,m	dipnet	Пh	13	
<u>shrimp</u> 011017.5a	<u>shrimp</u> 011017.5ahf Palaemonetes paludosus (freshwater shrimp)	s,sa,C,d,m	dipnet/visual	41		
- <u>snail</u> 011017.5a	<u>snail</u> 011017.5ahf Hydrobiidae (hydrobiid)	s.sa,C,d,m	dipnet/visual	11		
011017.5a	011017.5ahf Physella sp. (physa snail)	s,sa,C,d,m	dipnet/visual	I.h		
Hannah Cre	Hannah Creek @ SR 1159-					
clam						
011128.1b	011128.1btw Musculium partumeium (swamp fingernailclam)		dipnet			
011128.1b	011128.1btw Pisidium adamsi (Adam peaclam)		dipnet			
crayfish 011128.1b	crayfish 011128.1btw Procambarus (Ortmannieus) acutus (White River crayfish)		electroshock	278s		
fish						
011128.1b	011128.1btw Ameiurus sp. (bullhead)		visual		-	
011128.1b	011128.1btw Anguilla rostrata (American eel)		electroshock	278s		
011128.1btw	otw Aphredoderus sayanus (pirate perch)		electroshock	278s	2	
011128.1btw	otw Enneacanthus gloriosus (bluespotted sunfish)		electroshock	278s	-	
011128.1btw	otw Erimyzon oblongus (creek chubsucker)		electroshock	278s	2	
011128.1btw	otw Etheostoma fusiforme (swamp darter)		electroshock	278s	_	
011128.1btw	otw Etheostoma serrifer (sawcheek darter)		electroshock	278s	_	
011128.1btw	otw Gambusia holbrookii (eastern mosquitofish)		electroshock	278s	- -	
011128.1btw	otw Lepornis auritus (redbreast sunfish)		electroshock	278s	3	
011128.1btw	otw Lepomis macrochirus (bluegill)		electroshock	278s	2	
011128.1btw	otw Noturus gyrinus (tadpole madtom)		electroshock	278s	2	
snail						
011128.1b	011128.1btw Hydrobiidae (hydrobiid)		dipnet/visual			
011128.1b	011128.1btw Physella sp. (physa snail)		dipnet/visual			
Little Creek	Little Creek @ SR 1562					
clam						
011025.6a	011025.6ahf Corbicula fluminea (Asian clam)	Sa,d,m	dipnet	0.73h		

Location	89		Search		
Site (date) and species	Substrate	Technique	Time	#Live #Shells	
crayfish		1	721		
011025.0ant Procamoarus (Ormanincus) acutus (Wine Kivel Clayusii)	54,4,111	nibuci	0.731	n	
11311 (11025, Gahf Aphredoderus sayanus (pirate perch)	Sa,d,m	dipnet	0.73h	-	
011025.6ahf Etheostoma fusiforme (swamp darter)	Sa,d,m	dipnet	0.73h	_	
011025.6ahf Etheostoma nigrum/olmstedi (johnny/tesselated darter)	Sa,d,m	dipnet	0.73h	2	
011025.6ahf Gambusia holbrookii (eastern mosquitofish)	Sa,d,m	dipnet	0.73h		
011025.6ahf Lepomis macrochirus (bluegill)	Sa,d,m	dipnet	0.73h		
<u>shrimp</u> 011025.6ahf Palaemonetes paludosus (freshwater shrimp)	Sa,d,m	dipnet	0.73h		
snail					•
011025,6ahf Micromenetus dilatatus (bugle sprite)	Sa,d,m	dipnet	0.73h		
Little Creek @ SR 1562-/+					
fish					
011105.3btw Anguilla rostrata (American eel)		electroshock	545s	2	
011105.3btw Cyprinella analostana (satinfin shiner)		electroshock	5458	2	
011105.3btw Esox americanus (redfin pickerel)		electroshock	5458	_	
011105.3btw Gambusia holbrookii (eastern mosquitofish)		electroshock	545s	_	
011105.3btw Lepomis auritus (redbreast sunfish)		electroshock	545s		
011105.3btw Lepornis gibbosus (pumpkinseed)		electroshock	545s	-	
011105.3btw Lepomis macrochirus (bluegill)		electroshock	545s	_	
011105.3btw Notropis procne (swallowtail shiner)		electroshock	545s	_	
shrimp					
011105.3btw Palaemonetes paludosus (freshwater shrimp)		electroshock	545s	_	
Little River @ NC 96					
clam					
010530.1jaj Corbicula fluminea (Asian clam)	s,sa,g,r,d	visual/tactile	1.03h		
010530.2jaj Corbicula fluminea (Asian clam)	S,Sa,C,g,R,d	tactile/visual	1.08h		
010530.3jaj Corbicula fluminea (Asian clam)	S,Sa,C,co,b,G,r,d	tactile/visual	0.45h		
010530.4jaj Corbicula fluminea (Asian clam)	S,Sa,c,g,r,d	tactile/visual			
010531.1jaj Corbicula fluminea (Asian clam)	S,Sa,c,g,r,d	tactile/visual	1.12h		
010531.3jaj Corbicula fluminea (Asian clam)	C,S,sa,g,d,R,bo	tactile/visual			
mussel				ć	
010550.5jaj Atasmidonia unduata (mangle noater)	5,5a,C,co,b,G,r,d	tactile/visual	0.45h	7	
010530.4jaj Alasmidonta undulata (triangic floater)	S,Sa,c,g,r,d	tactile/visual		4	

Location Site (date) and species	Cubateato		Search		
mussel	Substrate	1 ecunique	Time	# Live	# Live # Shells
010531.1iai Alasmidonta undulata (triangle floater)					
	S,Sa,c,g,r,d	· tactile/visual	1.12h	-	
	s,sa,g,r,d	visual/tactile	1.03h	=	
	s,sa,g,r,d	visual/tactile	1.03h	-	
	S,Sa,C,g,R,d	tactile	1.08h		
	S,Sa,C,co,b,G,r,d	tactile	0.45h	1 33	
	S,Sa,c,g,r,d	tantila/vienal	0.450	90 5	
010531.1jaj Elliptio spp. (n/a)	S.Sa.c.g.r.d	tactity visual		52	
010531.2jaj Elliptio spp. (n/a)	S ca co D	racinic visual	1.12h	74	
010531.3jaj Elliptio spp. (n/a)	Of a break of	tactile	0.88h	132	
010530.3jaj Elliptio viridula (ereen fance)	(,,,,,a,g,u,r,,00	tactile		99	
	5,54,C,c0,b,C,r,d	visual	0.45h	_	
	5,5a,c,g,r,d	tactile/visual		2	
	S,Sa,c,g,r,d	tactile/visual	1.12h	15	
crossingal Emphro Villauda (green lance)	C,S,sa,g,d,R,bo	tactile		er.	
shail				ì	
010530.2jaj Campeloma decisum (pointed campeloma)	S.Sa.C.P.R.d	1			
010530.3jaj Campeloma decisum (pointed campeloma)	25 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	lacine/visual	1.08h		
010530,4jaj Campeloma decisum (pointed campeloma)	S. San and	tactile/visual	0.45h		
	D,1,8,1,6,1	tactile/visual			
Little River @ SR 1002					
clam					
010828.1jaj Corbicula fluminea (Asian clam)	7 000 000				
010828.2jaj Corbicula fluminea (Asian clam)	C,3,34,8,00,00	visual			
010828 3iai Corbicula fluminas (Aciem stans)	s,Sa,G,co,bo,v	visual	0.87h		
010008 Aid Continue of the Continue (Asian Cian)	C,Sa,G,bo	visual	0.67h		
V10020.4jaj Coroscula fluminea (Asian clam)	sa,g,Co,Bo	visual	0.83h		
crayfish			166:0		
010828.4jaj Cambarus sp. (n/a)	Sa.g. Co Bo	•			
fish		visuai	0.83h		
010828.4jaj Etheostoma sp. (n/a)	G () & 5				
010828.4iai Lenomis sp (n/a)	sa,g, Co, Do	visual	0.83h		
lossum lossum	sa,g,Co,Bo	visual	0.83h		
	C,S,Sa,g,co,bo	visual			
	C,S,Sa,g,co,bo	C. C.		- 6	
010828.2jaj Elliptio complanata (eastern Elliptio)	s.Sa.G.co.bo v	Visual		80	
010828.3jaj Elliptio complanata (eastern Elliptio)	CS G FC	Visual	0.87h	4	
010828. Jiaj Elliptio icterina (variable spike)	C, 54, U, 00	visual	0.67h		2
010828.2jaj Elliptio roanokensis (Roanoke statestall)	C,3,3a,g,c0,b0	visual		3	
	s,Sa,G,co,bo,v	visual	0.87h		, 7
			3500		1

Site (date) and species	Substrate	Technique	Time	# Live # Shells
mussel				
010828.1jaj Lampsilis radiata (eastern lampmussel)	C,S,Sa,g,eo,bo	visual		5
010828.1jaj lanceolate Elliptio (lance)	C,S,Sa,g,co,bo	visual		3
	sa,g,Co,Bo	visual	0.83h	
010828.1jaj Pyganodon cataracta (eastern floater)	C,S,Sa,g,co,bo	visual		3
010828. Jjaj Unknown (n/a)	C,S,Sa,g,co,bo	visual		2
snail				
010828.1jaj Campeloma decisum (pointed campeloma)	C,S,Sa,g,co,bo	visual		
010828.2jaj Campeloma decisum (pointed campeloma)	s,Sa,G,co,bo,v	visual	0.87h	
010828.2jaj Helisoma anceps (two-ridge rams-hom)	s,Sa,G,co,bo,v	visual	0.87h	
010828.3jaj Micromenetus dilatatus (bugle sprite)	C,Sa,G,bo	visual	0.67h	
010828.2jaj Physella sp. (physa snail)	s,Sa,G,co,bo,v	visual	0.87h	
Little River @ SR 1002+				
clam				
010828.1btw Corbicula fluminea (Asian clam)		dipnet/viewscope	1.25h	
crayfish				
010828.1btw Cambarus (Puncticambarus) sp. C (n/a)		dipnet/visual/viewscope	1.25h	_
010828.1btw Procambarus (Ortmannicus) acutus (White River crayfish)		dipnet/visual/viewscope	1.25h	2
fish				
010828.1btw Alosa sapidissima		visual/electroshock	649s	
010828.1btw Ameiurus sp. (bullhead)		visual/electroshock	649s	
010828.1btw Anguilla rostrata (American eel)		visual/electroshock	649s	
010828.1btw Cyprinella analostana (satinfin shiner)		visual/electroshock	649s	
010828.1btw Etheostoma nigrum/olmstedi (johnny/tesselated darter)		visual/electroshock	649s	
010828.1btw Ethcostoma vitreum (glassy darter)		visual/electroshock	649s	
010828.1btw Lepisosteus osseus (longnose gar)		visual/electroshock	649s	
010828.1btw Lepomis auritus (redbreast sunfish)		visual/electroshock	6498	
010828.1btw Lepomis macrochirus (bluegill)		visual/electroshock	649s	
010828.1btw Lythrurus matutinus (pinewoods shiner)		visual/electroshock	649s	
010828.1btw Micropterus salmoides (largemouth bass)		visual/electroshock	649s	
010828.1btw Nocomis leptocephalus (bluehead chub)		visual/electroshock	649s	
010828.1btw Notropis procne (swallowtail shiner)		visual/electroshock	649s	
010828.1btw Luxilus albeolus (white shiner)		visual/electroshock	6498	
010828.1btw Noturus insignis (margined madtom)		visual/electroshock	649s	
010828 15tu. Demina manaka (Roanake datter)		visual/electroshock	6406	

Location Site (date) and species	Substrate	Technique	Search Time	# Live # Shells
shrimp 010828.1btw Palacmonetes paludosus (freshwater shrimp)		dipnet	1.25h	
snail 010828.1btw Campeloma decisum (pointed campeloma) 010828.1btw Helisoma anceps (two-ridge rams-horn)		visual/dipnet visual/Dipnet	1.25h 1.25h	-
010828.1btw Micromenetus dilatatus (bugle sprite) 010828.1btw Physella sp. (physa snail)		Visual/Dipnet	1.25h	_
Little River @ SR 1934				
<u>clam</u> 011016.3ahf Corbicula fluminea (Asian clam)	s,sa,d,m	visual	0.93h	ò
crayfish 011016.3ahf Procambarus (Ortmannicus) acutus (White River crayfish)	s,sa,d,m	dipnet	0.93h	2
fish 011016 Joht Contracture macromtonic (flier)	m p es s	dinnet	0.93h	_
011016.3ahf Gambusia holbrookii (eastern mosquitofish)	s,sa,d,m	dipnet	0.93h	
011016.3ahf Lepomis auritus (redbreast sunfish)	s,sa,d,m	dipnet	0.93h	
011016,3ahf Lepomis macrochirus (bluegill)	s,sa,d,m	dipnet	0.93h	2
mussel 011016.3ahf Elliptio cistelliformis (box spike)	s,sa,d,m	visual	0.93h	
snail 011016.3ahf Helisoma anceps (two-ridge rams-horn)	m,b,ss,s	dipnet/visual	0.93h	-
011016.3ahf Hydrobiidae (hydrobiid)	s,sa,d,m	dipnet/visual	0.93h	_
011016.3ahf Physella sp. (physa snail)	s,sa,d,m	dipnet/visual	0.93h	
Little River @ SR 2130-				
clam 11105 Shine Continue fluminas (Asian dam)	Sociotores	lensiv		
fish				
011105.5btw Anguilla rostrata (American eel)	Sa,c.co,bo,p,g,v,d	electroshock	508s	
011105.5btw Enneacanthus gloriosus (bluespotted sunfish)	Sa,c.co,bo,p,g,v,d	electroshock	508s	_
011105.5btw Etheostoma nigrum/olmstedi (johnny/tesselated darter)	Sa,c.co,bo,p,g,v,d	electroshock	508s	
011105.5btw Hypentelium nigricans (northern hogsucker)	Sa,c.co,bo,p,g,v,d	electroshock	208s	
011105.5btw Lepomis auritus (redbreast sunfish)	Sa,c.co,bo,p,g,v,d	electroshock	508s	
011105.5btw Luxilus albeolus (white shiner)	Sa,c.co,bo,p,g,v,d	electroshock	508s	
011105.5btw Lythrurus matutinus (pinewoods shiner)	Sa,c.co,bo,p,g,v,d	electroshock	508s	4
011105.5btw Nocomis leptocephalus (bluehead chub)	Sa,c.co,bo,p,g,v,d	electroshock	508s	
011105.5btw Notropis procne(spottail shiner)	Sa,c.co,bo,p,g,v,d	electroshock	\$08s	
	30			

precies Substrate Technique signis (margined madrom) \$a_a_coobo_p_g_vd electroshock no cervinus (black jumprock) \$a_a_coobo_p_g_vd electroshock numinea (Asian clam) \$a_a_g_o,coop_q_d actile-troshock planata (eastern Elliptio) \$a_a_g_o,coop_q_d actile-troshock planata (eastern Ell	Location			Search		
gigis (murgined madom) Sh,c.o.bo.p.g.v.d electroshock 508s no cavinas (black jumpmeck) Sh,c.o.bo.p.g.v.d electroshock 508s no cavinas (black jumpmeck) Sh,c.o.bo.p.g.v.d electroshock 508s numinea (Asian clam) c.s.Sa.G.Co nearblovisual 0.3h uminea (Asian clam) s.s.B.v.D tactilevisual 1.55h uminea (Asian clam) s.s.B.v.D tactilevisual 1.55h uminea (Asian clam) s.s.B.v.D tactilevisual 0.7h planate (asian elliptic) s.s.B.v.D tactilevisual 0.7h planate (asian Elliptic) s.s.B.v.D tactilevisual 0.5h planate (asian Elliptic) s.s.B.v.D tactilevisual 0.5h planate (asian Elliptic) s.s.B.v.D tactilevisual 0.5h planate (asian Elliptic) s.s.B.s.G.c	Site (date) and species	Substrate	Technique	Time	#Live #Sh	ells
signific (margined maddum) Sin, e.co, bo, g.g., d. detertrebhock 508s noba (Rounoke darter) Sin, e.co, bo, g.g., d. detertrebhock 508s no erevirus (black jumprock) Sin, g.c., bo, g.g., d. detertrebhock 508s no erevirus (black jumprock) s, s.B.g., D. tactilovisual 1.1h uminea (Asian clam) s, s.B.g., D. tactilovisual 1.1h uminea (Asian clam) s, S.B.g.co, bo, rd tactilovisual 1.1h uminea (Asian clam) s, S.B.g.co, bo, rd tactilovisual 0.5h uminea (Asian clam) s, S.B.g.co, bo, rd tactilovisual 0.5h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile 1.15h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile 1.15h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile 1.15h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile 1.15h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile 1.15h planata (castern Elliptio) c, S.B.g.co, bo, rd tactile	<u>lish</u>					
Sa, co, bo, p, g, d electroshock 508s	011105.5btw Noturus insignis (margined madtom)	Sa,c.co,bo,p,g,v,d	electroshock	508s	\$	
on cervinns (black jumprock) Sa,c.co,bop.g.v,d electrroblock 508s unnirea (Asian clam) c,s,Sa,G.Co tactile/visual 0.5h unnirea (Asian clam) c,s,Sa,G.Co tactile/visual 1.5h unnirea (Asian clam) s,Sa,g.co,bo,r,d tactile/visual 0.5h unnirea (Asian clam) S,Sa,g.co,bo,r,d tactile/visual 0.5h unnirea (Asian clam) S,Sa,G.Co tactile visual 0.5h planata (eastern Elliptic) c,S,Sa,G.Co tactile 1.15 planata (eastern Elliptic) s,Sa,G.Co tactile visual 0.5h planata (eastern Elliptic) c,S,Sa,G.Co tactile visual 0.5h decisual (poi	011105.5btw Percina roanoka (Roanoke darter)	Sa,c.co,bo,p,g,v,d	electroshock	508s		
winter (Asian clam) cs.Sa,G,Co tactile/visual 0.5h uminea (Asian clam) s.sn,B,y,D tactile/visual 11h uminea (Asian clam) c.S.Sa,g.co,bo,r,d tactile/visual 0.5h uminea (Asian clam) S.sa,g.co,bo,r,d tactile/visual 0.77h uminea (Asian clam) c.S.Sa,G,Co tactile/visual 0.77h planata (castern Elliptio) c.S.Sa,G,Co tactile 1.65h planata (castern Elliptio) s.sa,B,v,O tactile 1.65h planata (castern Elliptio) s.sa,G,Co,bo,v,d tactile 1.55h planata (castern Ellip	011105.5btw Scartomyzon cervinus (black jumprock)	Sa,c.co,bo,p,g,v,d	electroshock	508s		
nines (Asian clam) c.s.Sa.G.Co tractitovisual 0.5h nines (Asian clam) s.s.B.v.D tactitovisual 1h nines (Asian clam) c.s.Sa.g.co, bo.r.d tactitovisual 0.5h nines (Asian clam) S.sa.g.co, bo.r.d tactitovisual 0.7h nines (Asian clam) c.s.Sa.G.Co tactitovisual 0.7h landa (castern Elliptio) s.sa.B.v.D tactitovisual 0.5h landa (castern Elliptio) s.Sa.G.co, bo.r.d tactito 1.55h landa (castern Elliptio) s.Sa.g.c.o, bo.r.d tactito 1.55h landa (castern Elliptio) s.Sa.g.c.o, bo.r.d tactito 1.55h sa.g.sa,G.Co s.Sa.g.c.o, bo.r.d tactito 1.55h quired (green lance) c.s.	Little River @ SR 2320					
intene (Asian clam) c.s.Sa.G.C. tactile/visual 1.h ninea (Asian clam) c.s.Sa.G.C. tactile/visual 1.h ninea (Asian clam) c.s.Sa.g.co, bo.r.d tactile/visual 0.51h ninea (Asian clam) S.sa.g.co, bo.r.d tactile/visual 0.77h ninea (Asian clam) s.sa.B.v.D tactile/visual 0.77h ninea (castern Elliptic) s.sa.B.v.D tactile/visual 0.77h lanata (castern Elliptic) s.Sa.g.co, bo.r.d tactile 1.05h lanata (castern Elliptic) s.sa.G.co, bo.r.d tactile of s.sa 0.5h lanata (castern Elliptic) s.sa.G.co, bo.r.d tactile of s.sa 0.5h lanata (castern Elliptic) s.sa.G.co, bo.r.d tactile of s.sa 0.5h lanata (castern Elliptic) s.sa.G.co, bo.r.d tactile of s.sa 0.5h lanata (castern Elliptic) s.sa.G.co, bo.r.d tactile of s.sa 0.5h lanata (castern Elliptic) s.sa.g.co, bo.r.d tactile of s.sa 0.5h la (gener) c.s.Sa.g.co, bo.r.d tactile of s.sa 0.5h <td>clam</td> <td></td> <td></td> <td></td> <td></td> <td></td>	clam					
inition (Asian clam) s,sa,B,v,D tactile/visual 1h inition (Asian clam) c,s,sa,g,co,bo,r,d tactile/visual 0.58n inition (Asian clam) S,sa,g,co,bo,r,d tactile/visual 0.77h inition (Asian clam) s,sa,g,co,bo,r,d tactile/visual 0.5h inition (Asian clam) s,sa,g,co,bo,r,d tactile 1.05h lanata (castern Elliptic) s,sa,g,co,bo,r,d tactile 1.55h lanata (castern Elliptic) s,sa,g,co,bo,r,d tactile 1.55h lanata (castern Elliptic) s,sa,g,co,bo,r,d tactile 1.55h lanata (castern Elliptic) s,sa,g,co,bo,r,d tactile or stactile 1.55h lanata (castern Elliptic) s,sa,g,co,bo,r,d tactile or stactile 1.55h a (variable spike) s,sa,g,co,bo,r,d tactile visual 0.5h	010725.1jaj Corbicula fluminea (Asian clam)	c,s,Sa,G,Co	tactile/visual	0.5h		
ninea (Asian clam) c, S. Sa.g.co, bo, r, d tactile/visual 1.55h ninea (Asian clam) S, Sa.g.co, bo, r, d tactile/visual 0.77h ninea (Asian clam) S, Sa.g.co, bo, r, d tactile/visual 0.77h landa (eastern Elliptic) s, Sa. G, co, bo, r, d tactile 1.05h landa (eastern Elliptic) s, Sa.g.co, bo, r, d tactile 1.55h landa (eastern Elliptic) c, S. Sa.g.co, bo, r, d tactile 0.77h landa (eastern Elliptic) S, Sa.g.co, bo, r, d tactile 0.77h landa (eastern Elliptic) S, Sa.g.co, bo, r, d tactile of t	010725.2jaj Corbicula fluminea (Asian clam)	s,sa,B,v,D	tactile/visual	Пh		
ninea (Asian clam) S,Sa,g,co,bo visual 0.5h ninea (Asian clam) S,sa,g,co,bo,rd tactile/visual 0.7h lanata (eastern Elliptio) s,sa,B,Co tactile 1h lanata (eastern Elliptio) s,sa,B,Co tactile 1/5h lanata (eastern Elliptio) s,sa,G,co,bo,rd tactile/visual 0.5h la (green lance) c,s,sa,G,Co tactile/visual 0.5h la (green lance) c,s,sa,G,Co tactile/visual 0.5h cissum (pointed campeloma) s,sa,B,v,D tactile/visual 0.5h cissum (pointed campeloma) s,sa,B,v,D tactile/visual 0.5h scisum (pointed campeloma) s,sa,B,v,D	010725.4jaj Corbicula fluminea (Asian clam)	c,S,Sa,g,co,bo,r,d	tactile/visual	1.55h		
ninea (Asian clam) S,sa,g.co,bo,rd tactile visual 0.77h lanata (castern Elliptio) c.s,Sa,G.Co tactile visual 0.5h lanata (castern Elliptio) s,Sa,g.co,bo,rd tactile 1.55h lanata (castern Elliptio) c,S,Sa,g.co,bo,rd tactile 1.55h lanata (castern Elliptio) S,Sa,g.co,bo,rd tactile visual 0.5h lanata (castern Elliptio) S,Sa,g.co,bo,rd tactile visual 0.5h lanata (castern Elliptio) S,Sa,G.Co tactile visual 0.5h lanata (castern Elliptio) s,Sa,G.Co tactile visual 0.5h lanata (castern Elliptio) s,Sa,G.Co tactile visual 0.5h la (green lance) c,S,Sa,G.Co tactile visual 0.5h ceisum (pointed campeloma) c,S,Sa,G.Co tactile visual 0.5h ceisum (pointed campeloma) <td>010725.5jaj Corbicula fluminea (Asian clam)</td> <td>S,Sa,g,co,bo</td> <td>visual</td> <td>0.58h</td> <td></td> <td></td>	010725.5jaj Corbicula fluminea (Asian clam)	S,Sa,g,co,bo	visual	0.58h		
In the castern Elliptio S,SA,G,Co Inctile/visual 0.5th In the castern Elliptio S,SA,G,Co Dov,d Inctile 1.05th In the castern Elliptio S,SA,G,Co Dov,d Inctile 1.05th In the castern Elliptio S,SA,G,Co Dov,d Inctile 1.55th In anala (castern Elliptio) S,SA,G,Co Dov,d Inctile 0.7th In anala (castern Elliptio) S,SA,G,Co Inctile 0.7th In a (variable spike) S,SA,G,Co Inctile 0.5th In a (variable spike) S,SA,G,Co Inctile 0.5th In a (variable spike) S,SA,G,Co Inctile 1.55th In a (variable spike) S,SA,G,Co Inctile 1.55th In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lance) In a (green lan	010725.6jaj Corbicula fluminea (Asian clam)	S,sa,g,co,bo,r,d	tactile/visual	0.77h		•
land a (eastern Elliptic) c,s,Sa,G,Co tactile/visual 0.5h landa (eastern Elliptic) s,sa,By,D tactile 1h landa (eastern Elliptic) c,S,Sag,co,bo,r,d tactile 1.05h landa (eastern Elliptic) S,Sag,co,bo,r,d tactile 1.55h landa (eastern Elliptic) S,Sag,co,bo,r,d tactile 0.5h landa (eastern Elliptic) c,Sag,co,bo,r,d tactile 0.5h la (variable spike) c,Sag,co,bo,r,d tactile/visual 0.5h la (green lance) c,Sag,co,bo,r,d tactile/visual 0.5h la (green lance) c,Sag,co,bo,r,d tactile/visual 0.5h la (green lance) c,Sag,co,bo,r,d tactile/visual 0.5h ccisum (pointed campeloma) c,Sag,co,bo,r,d tactile/visual 0.7h ccisum (point	mussel					
In the castern Elliptio s,sa,B,v,D tactile In the landa (castern Elliptio) s,Sa,G.co,bo.v,d tactile I.55h Inanda (castern Elliptio) s,Sa,G.co,bo.r,d tactile I.55h Inanda (castern Elliptio) c,S,Sa,G.co,bo.r,d tactile I.55h In (variable spike) c,S,Sa,G.co,bo.r,d tactile I.55h In (streen lance) c,S,Sa,G.co,bo.r,d tactile I.55h In (streen (pointed campeloma)	010725.1jaj Elliptio complanata (eastem Elliptio)	c,s,Sa,G,Co	tactile/visual	0.5h	29	
lanata (castern Elliptio) s,Sa,G,c,o,bo,v,d tactile 1.55h lanata (castern Elliptio) c,S,Sa,g,co,bo,r,d tactile 1.55h lanata (castern Elliptio) S,Sa,g,co,bo,r,d tactile 0.77h lanata (castern Elliptio) S,Sa,g,co,bo,r,d tactile 0.77h la (variable spike) c,s,Sa,G,Co tactile 1.05h la (green lance) c,S,Sa,g,co,bo,r,d tactile/visual 0.5h la (green lance) c,S,Sa,G,Co tactile/visual 0.5h cisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h cisum (pointed campeloma) s,sa,B,v,D tactile/visual 0.5h cisum (pointed campeloma) s,sa,B,c,O,o tactile/visual 0.5h cisum (pointed campeloma) s,sa,B,c,O,o tactile/visual 0.5h digavel climia) <td>010725.2jaj Elliptio complanata (eastern Elliptio)</td> <td>s,sa,B,v,D</td> <td>tactile</td> <td>ų.</td> <td>3</td> <td></td>	010725.2jaj Elliptio complanata (eastern Elliptio)	s,sa,B,v,D	tactile	ų.	3	
Saag.co,bo,r,d castern Elliptio C,S.Saag.co,bo,r,d castern Elliptio S,Saag.co,bo,r,d visual 0.58h Ianata (eastern Elliptio S,Saag.co,bo,r,d tactile 0.77h Ianata (eastern Elliptio S,Sa,G,Co tactile 0.77h Ianata (eastern Elliptio S,Sa,G,Co,bo,r,d tactile 0.5h Ianata (eastern Elliptio C,S,Sa,G,Co tactile 0.5h Ianata (eampeloma S,Sa,G,Co tactile 0.5h tactile 0.5h Ianata (eampeloma S,Sa,G,Co tactile 0.5h tactile 0.5h Ianata (eampeloma S,Sa,G,Co tactile 0.5h tactile 0.5h tactile 0.5h Ianata (eampeloma S,Sa,G,Co tactile 0.5h tactile 0.5h tactile 0.5h tactile 0.5h Ianata (eampeloma 0.5h tactile 0.5h ta	010725.3jaj Elliptio complanata (eastern Elliptio)	s,Sa,G,co,bo,v,d	tactile	1.05h	81	
landa (castern Elliptio) \$,Sag,co,bo visual 0.5Bn landa (castern Elliptio) 5,sag,co,bo,r,d tactile 0.77h la (variable spike) s,Sa,G,Co tactile (visual) 0.5h la (variable spike) s,Sa,G,co,bo,r,d tactile (visual) 1.55h la (green lance) c,S,Sa,G,Co tactile (visual) 0.5h la (green lance) c,S,Sa,G,Co tactile (visual) 0.5h iptio (lance) c,S,Sa,G,Co tactile (visual) 0.5h ccisum (pointed campeloma) c,S,Sa,G,Co tactile (visual) 0.5h ccisum (pointed campeloma) s,sa,B,v,D tactile (visual) 0.5h ccisum (pointed campeloma) s,sa,B,v,D tactile (visual) 0.5h ccisum (pointed campeloma) s,sa,B,v,D tactile (visual) 0.5h ccisum (pointed campeloma) S,Sa,G,Co tactile (visual) 0.5h ccisum (pointed campeloma) S,Sa,G,Co tactile (visual) 0.5h ccisum (pointed campeloma) S,Sa,G,Co tactile (visual) 0.5h ccisum (pointed camp	010725.4jaj Elliptio complanata (eastern Elliptio)	c,S,Sa,g,co,bo,r,d	tactile	1.55h	101	
landata (eastern Elliptio) S,sag.co,bo,r,d tactile 0.77h na (variable spike) c,s,Sa,G,Co tactile/visual 0.5h na (variable spike) s,Sa,G,co,bo,r,d tactile 1.05h na (variable spike) c,S,Sa,G,Co tactile 1.55h na (variable spike) c,S,Sa,G,Co tactile/visual 0.5h la (green lance) c,S,Sa,G,Co tactile/visual 0.5h la (green lance) c,S,Sa,G,Co tactile/visual 0.5h ccisum (pointed campeloma)	010725.5jaj Elliptio complanata (eastern Elliptio)	S,Sa,g,co,bo	visual	0.58h	3	
na (variable spike) c,s,Sa,G,Co tactile/visual 0.5h na (variable spike) s,Sa,G,co,bo,v,d tactile 1.05h na (variable spike) c,S,Sa,G,co,bo,r,d tactile 1.55h la (green lance) c,S,Sa,G,Co tactile/visual 0.5h pitio (lance) c,S,Sa,G,Co tactile/visual 0.5h ceisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h ceisum (pointed campeloma) s,sa,B,v,D tactile/visual 0.5h ceisum (pointed campeloma) s,sa,B,v,D tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co,bo,r,d tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co,bo,r,d tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campelo	010725.6jaj Elliptio complanata (eastern Elliptio)	S,sa,g,co,bo,r,d	tactile	0.77h	18	
na (variable spike) s,Sa,G,co,bo,v,d tactile 1.05h na (variable spike) c,S,Sa,g.co,bo,r,d tactile/visual 1.55h la (green lance) c,S,Sa,G,Co tactile/visual 0.5h pitio (lance) c,S,Sa,G,Co tactile/visual 0.5h ceisum (pointed campeloma) c,S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) c,S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) s,Sa,B,V,D tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,G,Co <td< td=""><td>010725.1jaj Elliptio icterina (variable spike)</td><td>c,s,Sa,G,Co</td><td>tactile/visual</td><td>0.5h</td><td>3</td><td></td></td<>	010725.1jaj Elliptio icterina (variable spike)	c,s,Sa,G,Co	tactile/visual	0.5h	3	
na (variable spike) c,S,Sa,g.co,bo,r,d tactile 1.55h la (green lance) c,s,Sa,G,Co tactile/visual 0.5h ig (green lance) c,s,Sa,G,Co tactile/visual 0.5h cvisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h ccisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h ccisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h ccisum (pointed campeloma) c,s,Sa,g.co,bo,r,d tactile/visual 0.5h ccisum (pointed campeloma) S,Sa,g.co,bo,r,d tactile/visual 0.7h ria (gravel climia) c,s,Sa,G,Co tactile/visual 0.5h ria (gravel climia) c,s,Sa,G,Co tactile/visual 0.5h ria (gravel climia) c,s,Sa,G,Co tactile/visual 0.5h	010725.3jaj Elliptio icterina (variable spike)	s,Sa,G,co,bo,v,d	tactile	1.05h	-	
la (green lance) c,s,Sa,G,Co tactile/visual 0.5h iptio (lance) c,s,Sa,G,Co tactile/visual 1.55h ccisum (pointed campeloma) c,s,Sa,G,Co tactile/visual 0.5h ecisum (pointed campeloma) s,sa,B,v,D tactile/visual 1.55h ecisum (pointed campeloma) c,s,Sa,g,co,bo,t,d tactile/visual 0.5h ecisum (pointed campeloma) S,Sa,g,co,bo,t,d tactile/visual 0.7h ecisum (pointed campeloma) S,Sa,g,co,bo,t,d tactile/visual 0.5h ecisum (pointed campeloma) S,sa,g,co,bo,t,d tactile/visual 0.5h ia (gravel climia) c,s,Sa,G,Co tactile/visual 0.5h uncticambarus) sp. C (n/a) c,s,Sa,G,Co tactile/visual 0.5h dinnet/electroshock/vis. 2h/1065s	010725.4jaj Elliptio icterina (variable spike)	c,S,Sa,g,co,bo,r,d	tactile	1.55h	4	
la (green lance) c, S, Sa, G, Co iptio (lance) cisum (pointed campeloma) ceisum (pointed campeloma) c, S, Sa, G, Co ceisum (pointed campeloma) c, S, Sa, G, Co, bo, r, d ceisum (pointed campeloma) c,	010725.1jaj Elliptio viridula (green lance)	c,s,Sa,G,Co	tactile/visual	0.5h	_	
iptio (lance) c.s,Sa,G,Co ceisum (pointed campeloma) c.s,Sa,G,Co ceisum (pointed campeloma) S,Sa,g,co,bo,r,d ceisum (pointed campeloma) S,Sa,g,co,bo,r,d ceisum (pointed campeloma) S,Sa,g,co,bo,r,d cisum (pointed campeloma) S,Sa,g,co,bo,r,d cisum (pointed campeloma) cisum (pointed campeloma) cisum (pointed campeloma) S,Sa,g,co,bo cisum (pointed campeloma) cisum (pointed camp	010725.4jaj Elliptio viridula (green lance)	c,S,Sa,g,co,bo,r,d	tactile/visual	1.55h	\$	
ecisum (pointed campeloma) S,Sa,g,co,bo ecisum (pointed campeloma) S,Sa,g,co,bo,r,d ia (gravel elimia) c,s,Sa,G,Co dipnet/electroshock/vis.	010725.1jaj lanceolate Elliptio (lance)	c,s,Sa,G,Co	tactilc/visual	0.5h	2	
ecisum (pointed campeloma) c,s,Sa,G,Co tactile/visual s,sa,B,v,D s,sa,B,v,D tactile ta	ail					
ecisum (pointed campeloma) s,sa,B,v,D tactile cisum (pointed campeloma) c,S,Sa,g,co,bo,r,d tactile/visual scisum (pointed campeloma) S,Sa,g,co,bo tactile visual S,Sa,g,co,bo,r,d tactile tactile cisum (pointed campeloma) S,Sa,g,co,bo,r,d tactile tactile cisum (pointed campeloma) C,S,Sa,G,Co tactile tactile/visual c,S,Sa,G,Co dipnet/electroshock/vis.		c,s,Sa,G,Co	tactile/visual	0.5h		
ecisum (pointed campeloma) c, S, Sa, g, co, bo, r, d s, Sa, g, co, bo, r, d s, Sa, g, co, bo, r, d cisum (pointed campeloma) S, Sa, g, co, bo, r, d s, sa, g, co, bo, r, d tactile tactile c, s, Sa, G, Co tactile/visual c, s, Sa, G, Co dipnet/electroshock/vis.	010725.2jaj Campeloma decisum (pointed campeloma)	s,sa,B,v,D	tactile	н		
ecisum (pointed campeloma) S,Sa,g,co,bo s,sa,g,co,bo tactile ria (gravel elimia) C,S,Sa,G,Co tactile/visual c,S,Sa,G,Co dipnet/electroshock/vis.	010725.4jaj Campeloma decisum (pointed campeloma)	c,S,Sa,g,co,bo,r,d	tactile/visual	1.55h		
ecisum (pointed campeloma) S,sa,g,co,bo,r,d tria (gravel elimia) c,s,Sa,G,Co tractile/visual c,s,Sa,G,Co tractile/visual dipnet/electroshock/vis.	010725.5jaj Campeloma decisum (pointed campeloma)	S,Sa,g,co,bo	visual	0.58h		
ria (gravel elimia) c,s,Sa,G,Co tactile/visual c,s,Sa,G,Co tactile/visual dipnet/electroshock/vis.	010725.6jaj Campeloma decisum (pointed campeloma)	S,sa,g,co,bo,r,d	tactile	0.77h		
uncticambarus) sp. C (n/a) dipnet/electroshock/vis.	010725.1jaj Elimia catenaria (gravel climia)	c,s,Sa,G,Co	tactile/visual	0.5h		
btw Cambarus (Puncticambarus) sp. C (n/a) two Procambarus (Ortmannicus) acutus (White River cravitish)	Little River @ SR 2320+					
ulpiteVetectiosinock vis. dinnet/electroshack/vis	aylish		dimental and and and their	25/10650		
	010828.2btw Cantoarus (Tuncticanioarus) sp. C. (198)		dipnet/electroshock/vis.	2h/1065s	_	

Size (date) and species Substrate Trechinique Time # Live # Shells 01082 20ce Americans pinkycapishus (fun bullenss) checroshock 10553 10555 01082 20ce Release belancing (control collection) 10555 10555 10555 01082 20ce Release belancing (collection) 10555 10555 10555 01082 20ce Legenine interceive (collection) 10555 10555 10555 01082 20ce Legenine interceive (collection) 10555 10555 10555 01082 20ce Legenine interceive (collection) 10555 10555 10555 01082 20ce Micropeters administed (collection) 10555 10555 10555 01082 20ce Network promote (collection) 10555 10555 10555 10555 01082 20ce Network promote (collection) 10555 10555 10555 10555 10555 01082 20ce Network promote (collection) 10555 10555 10555 10555 10555 01082 20ce Network points (collection) <	Location		Search			
attended that with early electroshock 1065s blook (American cell) electroshock 1065s blook (American cell) electroshock 1065s blook (American cell) electroshock 1065s sing (Active ast sanifak) electroshock 1065s crochbard (Montaced chank) electroshock 1065s crochbard (Montaced chank) electroshock 1065s crochbard (Montaced chank) electroshock 1065s obic (while shines) electroshock 1065s obic (while shineshoute	Site (date) and species	Substrate	Technique	Time		# Shells
1055 1	fish					
treats (American eet) all controls of Charmy (assestant et) binotial (charmy (assestant et) binotial (charmy (assestant et) binotial (charmy (assestant et) cochinar (obinegil) cochinar (obineg			electroshock	1065s		
District			electroshock	10658		
1000 cloth castern mosquitoffah 1005 cloth castern fahiore 1007 cloth castern fahiore			electroshock	1065s		
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cochinas (bluegill) electroshock 1065s salmoides (bluegill) electroshock 1065s cere (briganouth bass) electroshock 1065s cere (evallowtal shiner) 1065s 1065s cere (evallowtal shiner) 1065s 1065s pris (evalle shiner) 1065s 1065s pris (evalle shiner) 1065s 1065s pris (evalle shiner) electroshock 1065s pris (evalle shiner) electroshock 1065s pris (evalle shiner) electroshock 1065s noka (Reanobe dater) 2h dependence (dater) 107h spaludosus (frisk jumpock) 2h spaludosus (frisk jumpock) 2h spaludosus (frisk jumpock) 2h decisionn (pointed campelorms) 4h electroshock (vis. 2h <td></td> <td></td> <td>electroshock</td> <td>1065s</td> <td></td> <td></td>			electroshock	1065s		
1065s 1065			electroshock	1065s		
conce (wellowall shiner) electroshock 1065s olos (white shiner) 1065s 1065s olos (white shiner) 1065s 1065s puis (cursilowall shiner) 1065s 1065s puis (cursilowall shiner) 1065s 1065s puis (cursilowall shiner) 1065s 1065s ata (shield dater) 1065s 1065s ata (shield dater) 1065s 1065s sta (Roanoke dater) 1065s 1065s skield dater) 1065s 1065s skield dater) 1065s 1065s sta (Roanoke dater) 1065s 1065s skield dater) 4ipnet/visual 2h sta (Roanoke dater) 2h 4ipnet/visual 2h sta (Roanoke dater) 4ipnet/visual 2h 2h decisium (pointed eampeloms) 4ipnet/visual 2h 2h decisium (pointed eampeloms) 4ipnet/visual 2h 2h sta (Gasan (pointed eampeloms) 5sa.p.p.d 4ipnet/visual 2h decisum (p			electroshock	10658		
coloctoshock 1065s cloctroshock 1065s guis (walfu shiner) 1065s cloctroshock 1065s guis (margined mardrom) 1065s ata (whide dater) 1065s ata (whide dater) 1065s cloctroshock 1065s cloctroshock dater) 1065s cervinus (black jumprock) 1065s cervinus (black jumprock) dipnet/visual 2h cervinus (black jumprock) 2h/lo65s cervinus (black jumprock) 2h/lo65s decisum (pointed campeloma) 4h/lo65s decisum (pointed campeloma) Sa,c.p.d dipnet/visual 2h decisum (black filmin) Agoc.p.d dipnet/visual 1,07h sunta (white River caylen) Sa,c.p.d dipnet/visual 1,07h d			electroshock	1065s		
olus (white shiner) electroshock 1065s pris (margined madtom) electroshock 1065s tat (shiedd darter) electroshock 1065s n eevinus (black jumprock) 1065s seus (dusky ancylid) dipnet/visual 2h seus (dusky ancylid) dipnet/visual 2h seus (dusky ancylid) dipnet/visual 2h se paludosus (freshwater shrimp) dipnet/visual 2h st paludosus (freshwater shrimp) dipnet/visual 2h st paludosus (freshwater shrimp) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (puster entre) Sa,cp,d dipnet/visual 2h minea (Asian clam) Sa,cp,d dipnet/visual 1,07h spressicambarus) latimanus (n/s) Sa,cp,d dipnet 1,07h procericambarus) containe (white River ensylfsh) Sa,cp,d dipnet 1,07h procericambarus) acutuus (White River ensylfsh) Sa,cp,d dipnet 1,07h			electroshock	1065s		
guis (margined mathom) electroshock 1065s tas (shield darter) electroshock 1065s oka (Reanoke darter) 1065s 1065s n eer/mus (black jumprock) 1065s 1065s scus (dusky ancylid) dipnet/visual 2h st paludosus (freshwater shrimp) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h depression (pointed campeloma) dipnet/visual 2h cps (two-ridge rams-hom) dipnet/visual 2h (hydrobiid) adipnet/visual 2h iditatus (bugle sprife) sa,c,p,d dipnet/visual 1,07h ium (greater eastern peaclam) Sa,c,p,d dipnet 1,07h 4 pressicambarus) latimanus (u/s) Sa,c,p,d dipnet 1,07h 2 Procericambarus (u/s) Sa,c,p,d dipnet 1,07h 1 Sa,c,p,d dipnet 1,07h 1,07h<	010828.2btw Luxilus albeolus (white shiner)		electroshock	1065s		
rate (Roanobe darter) electroshock 1065s roka (Roanobe darter) fectroshock 1065s rocervinus (black jumprock) 1065s 1065s scus (dusky ancylid) dipnet/visual 2h scus (dusky ancylid) dipnet/visual 2h scus (dusky ancylid) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h rogs (two-ridge rams-hom) dipnet/visual 2h cps (two-ridge rams-hom) dipnet/visual 2h cps (two-ridge rams-hom) dipnet/visual 2h dipnet/visual 1,07h sa.c.p.d dipnet/visual 1,07h dipnet/visual 1,07h 2 dipnet/visual	010828.2btw Noturus insignis (margined madtom)		electroshock	1065s		
oka (Roanoke darter) electroshock 1065s n cervimus (black jumprock) electroshock 1065s scus (dusky ancylid) dipnet/visual 2h scus (dusky ancylid) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h decisum (pointed campeloma) dipnet/visual 2h cps (two-ridge rams-hom) dipnet/visual 2h flydrobiid) s dipnet/visual 2h us dilatatus (bugle sprite) s dipnet/visual 2h uminea (Asian clam) Sa.c.p.d dipnet/visual 2h s dilatatus (bugle sprite) s dipnet/visual 1,07h 4 s digrater castern pecalam) Sa.c.p.d dipnet/visual 1,07h 4 spressicambanus) latimanus (tr/k) Sa.c.p.d dipnet/visual 1,07h 2 correcticambanus) acutus (White River crayfish) Sa.c.p.d dipnet/visual 1,07h 1 Sa.c.p.d Sa.c.p.d dipnet/visual 1,07h 1 </td <td>010828,2btw Percina peltata (shield darter)</td> <td></td> <td>electroshock</td> <td>10658</td> <td></td> <td></td>	010828,2btw Percina peltata (shield darter)		electroshock	10658		
electroshock loses (dack jumprock) dipnet/visual character shrimp) dipnet/visual 2h dipnet/	010828.2btw Percina roanoka (Roanoke darter)		electroshock	1065s		
scus (dusky ancylid) spaludosus (freshwater shrimp) decisum (pointed campeloma) ania (gravel elimia) decisum (pointed campeloma) dipnet/visual dipnet/visual dipnet/visual dipnet/visual thydrobiid) as dilatatus (bugle sprite) as dilatatus (bugle sprite) as dilatatus (bugle sprite) as dilatatus (bugle sprite) bus dilatatus (bugle sprite) as dilatatus (bugle sprite) as dilatatus (bugle sprite) bus dilatatus (bugle sprite) as dipnet (Asian clam) Sa,c,p,d dipnet dipnet 1.07h dipnet 1.07h dipnet 1.07h dipnet As a,c,p,d dipnet 1.07h			electroshock	1065s		
is paludosus (freshwater shrinp) decisum (pointed campeloma) dipnet/visual dipnet/visual 2h dipnet/visual 2h dipnet/visual 2h dipnet/visual 1,07h sa.c.p.d dipnet 1,07h 1,	limpet 010828.2btw Laevapex fuscus (dusky ancylid)		dipnet/visual	2h		
decisum (pointed campetoma) decisum (pointed campetoma) decisum (pointed campetoma) ceps (two-ridge rams-hom) (hydrobiid) (hydrobiid) as dilatatus (bugle sprite) minea (Asian clam) sac,p,d dipnet/visual Sac,p,d dipnet/visual 1,07h dipnet 1,07h Adipnet 1,07h Adipnet 1,07h Sac,p,d dipnet 1,07h Adipnet 1,07h Sac,p,d dipnet 1,07h Adipnet 1,07h Sac,p,d dipnet 1,07h Adipnet Adipnet 1,07h Adipnet Adipnet Adipnet 1,07h Adipnet Adip	shrimp 010828.2btw Palaemonetes paludosus (freshwater shrimp)		dipnet/electroshock/vis.	2h/1065s		
aria (gravel elimia) ceps (two-ridge rams-horn) (hydrobiid) lus dilatatus (bugle sprite) minea (Asian clam) minea (Asian clam) sa,c,p,d cpressicambarus) latimanus (n/a) cpressicambarus) carolinensis (NC spiny cnayfish) Sa,c,p,d dipnet dipnet dipnet 1.07h	8.2btw		dipnet/visual	2h		
ceps (two-ridge rams-horm) dipnet/visual 2h (hydrobiid) 2h us dilatatus (bugle sprite) 4 minea (Asian clam) Sa,c,p,d dipnet/visual minea (Asian clam) Sa,c,p,d dipnet epressicambarus) latimanus (n/a) Sa,c,p,d dipnet 1,07h epressicambarus) carollinensis (NC spiny crayfish) Sa,c,p,d dipnet 1,07h 2 (Ortmannicus) acutus (White River crayfish) Sa,c,p,d dipnet 1,07h 1			dipnet/visual	2h		
(hydrobiid) us dilatatus (bugle sprite) minea (Asian clam) minea (Asian clam) minea (Asian clam) sa,c,p,d dipnet/visual lum (greater eastern peaclam) sa,c,p,d cpressicambarus) latimanus (n/a) sa,c,p,d dipnet lum (greater eastern peaclam) sa,c,p,d dipnet lum (greater eastern peaclam) sa,c,p,d dipnet lum (dipnet lum (dipnet) lum (dipnet lum (dipnet			dipnet/visual	2h		
minea (Asian clam) minea (Asian clam) minea (Asian clam) sa,c,p,d sa,c,p,d cpressicambarus) latimanus (n/a) Procericambarus) carolinensis (NC spiny crayfish) Sa,c,p,d Ortmannicus) acutus (White River crayfish) Sa,c,p,d Gipnet 1.07h 4 Aipnet 1.07h 2 Aipnet 1.07h 3a,c,p,d Aipnet 1.07h 3a,c,p,d Aipnet 1.07h 1.07h 1.07h	010828.2btw Hydrobiidae (hydrobiid)		dipnet/visual	2h		
minea (Asian clam) Sa,c,p,d dipnet/visual 1.07h Sa,c,p,d cpressicambarus) latimanus (n/a) Procericambarus) carolinensis (NC spiny crayfish) Sa,c,p,d Ortmannicus) acutus (White River crayfish) Sa,c,p,d Gipnet 1.07h 4 dipnet 1.07h 2 dipnet 1.07h 1.07h 2	010828.2btw Micromenetus dilatatus (bugle sprite)		dipnet/visual	2h		
Sa,c,p,d dipnet/visual 1.07h Sa,c,p,d dipnet 1.07h Sa,c,p,d dipnet 1.07h Sa,c,p,d dipnet 1.07h 2 Sa,c,p,d dipnet 1.07h 1	Middle Creek @ NC 210					
Sa,c,p,d dipnet 1.07h Sa,c,p,d dipnet 1.07h 4 Sa,c,p,d dipnet 1.07h 2 Sa,c,p,d dipnet 1.07h 1	011025.1ahf Corbicula fluminea (Asian clam)	Sa,c,p,d	dipnet/visual	470.		
Sa,c,p,d dipnet 1.07h 4 Sa,c,p,d dipnet 1.07h 2 Sa,c,p,d dipnet 1.07h 1	011025.1ahf Pisidium dubium (greater eastern peaclam)	Sa,c,p,d	dipnet	1.07h		
Sa,c,p,d dipnet 1.07h 4 Sa,c,p,d dipnet 1.07h 2 Sa,c,p,d dipnet 1.07h 1	crayfish					
Sa,c,p,d dipnet 1.07h 2 Sa,c,p,d dipnet 1.07h 1	011025.1ahf Cambarus (Depressicambarus) latimanus (n/a)	Sa,c,p,d	dipnet	1.07h	4	0
Sa,c,p,d dipnet 1.07h 1	011025.1ahf Orconectes (Procericambarus) carolinensis (NC spiny crayfish)	Sa,c,p,d	dipnet	1.07h	2	0
	011025.1ahf Procambarus (Ortmannicus) acutus (White River crayfish)	Sa,c,p,d	dipnet	1.07h	Berry	0

Location		Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells
fish				
011025.1ahf Enneacanthus gloriosus (bluespotted sunfish)	Sa,c,p,d	dipnet	1.07h	_
011025.1ahf Etheostoma nigrum/olmstedi (johnny/tesselated darter)	Sa,c,p,d	dipnet	1.07h	3
011025.1ahf Gambusia holbrookii (eastern mosquitofish)	Sa,c,p,d	dipnet	1.07h	
011025.1ahf Lepomis macroehirus (bluegill)	Sa,c,p,d	dipnet	1.07h	2
<u>limpet</u> 011025.1ahf Laevapex fuscus (dusky ancylid)	Sa,c,p,d	dipnet/visual	1.07h	
<u>mussel</u> 011025.1ahf Elliptio (eastern Elliptio)	Sa,c,p,d	visual	1.07h	
shrimp 011025.1ahf Palaemonetes paludosus (freshwater shrimp)	Sa,c,p,d	dipnet	1.07h	
snail				i
011025.1ahf Elimia catenaria (gravel elimia)	Sa,c,p,d	dipnet/visual	1.07h	
011025.1ahf Helisoma anceps (two-ridge rams-hom)	Sa,c,p,d	dipnet/visual	1.07h	
011025.1ahf Hydrobiidae (hydrobiid)	Sa,c,p,d	dipnet/visual	1.07h	
011025.1ahf Physella sp. (physa snail)	Sa,c,p,d	dipnet/visual	1.07h	
Middle Creek @ NC 210+				
clam				
011102.5btw Corbicula fluminea (Asian clam)		visual		
011102.5btw Anguilla rostrata (American eel)		electroshock	184s	2
011102.5btw Chaenobryttus gulosus (warmouth)		electroshock	184s	
011102.5btw Lepomis auritus (redbreast sunfish)		electroshock	184s	2
Middle Creek @ NC 50				
011025.4ahf Corbicula fluminea (Asian clam)	s,Sa,p,M	dipnet	111	
011025.4ahf Sphaerium striatinum (striated fingernailclam)	s,Sa,p,M	dipnet	II.	
<u>crayfish</u> 011025 4ahf Cambanis (Denrecsicambanis) latinanis (n/a)	Maes	dinnet/visual	=	_
011025.4ahf Orconectes (Procericambarus) carolinensis (NC spiny crayfish)	s,Sa,p,M	dipnct/visual	ᄪ	4
fish.				
011025.4ahf Enneacanthus gloriosus (bluespotted sunfish)	s,Sa,p,M	dipnet	4	3
011025.4ahf Etheostoma nigrum/olmstedi (johnny/tesselated darter)	s,Sa,p,M	dipnet	ᄪ	S
limpet				
011025.4ahf Ferrissia sp. (n/a)	s,Sa,p,M	dipnet	=	
011025.4ahf Laevapex fuscus (dusky ancylid)	s,Sa,p,M	dipnet	4	
	23			

Substrate Technique Links k) Saccopg.rd electroshock 1146s mailclam) ssac.d.m dipnet 0.5h fulle River cayfish) ssac.d.m dipnet 0.5h fulle River cayfish) ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h brintp) ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h hrimp) ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h ssac.d.m dipnet 0.5h meal) ssac.d.m dipnet 0.5h lm) dipnet 0.5h dm dipnet 0.5h dipnet 0.5h 0.5h dipnet 0.5h 0.5h dipnet		•	Search	Ė	
tan (Romanic dates) Sa, α, α, β, β electroshock (alteroshock parted) 1146s cervinus (black jumprock) Sa, α, α, β, m dipper 0.5h rammi (ubjaulous peaclam) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Ormannicus) acutus (White River cmyfish) s, sa, α, d, m dipper 0.5h Symmetricus (Girce) s, sa, α, d, m dipper 0.5h symmetricus (Girce) s, sa, α, d, m dipper 0.5h ochinas (bluegili) s, sa, α, d, m dipper 0.5h ochinas (bluegili) s, sa, α, d, m dipper 0.5h ochinas (bluegili) s, sa, α, d, m dipper 0.5h	Site (date) and species	Substrate	Technique	Time	# Live # Shells
table formation (warmy fingermailclam) Sancodng grd electroshock after the finance of the finance o					
cervinus (black jumprock) S.s.a.p.d.m dectroshood 1146s runnelium (evanity fingermailclarm) s.sa.p.d.m dippret 0.5h runnelium (evanity fingermailclarm) s.sa.p.d.m dippret 0.5h Ortmannicus) soutus (White River cray/fish) s.sa.p.d.m dippret 0.5h Ortmannicus) soutus (White River cray/fish) s.sa.p.d.m dippret 0.5h sydnost (warmouth) s.sa.p.d.m dippret 0.5h golvisus (buespotted surfish) s.sa.p.d.m dippret 0.5h sydnost (castern mosquioffish) s.sa.p.d.m dippret 0.5h sochine (swamp dater) s.sa.p.d.m dippret 0.5h sochine (swamp dater) s.sa.p.d.m dippret 0.5h sochine (swamp dater) s.sa.p.d.m dippret 0.5h sochine (bluegill) s.sa.p.d.m dippret 0.5h via s.sa.p.d.m dippret 0.5h s.sa.p.d.m s.sa.p.d.m dippret 0.5h s.sa.p.d.m s.sa.p.d.m dippret 0.5h <	w Percina roanoka (Roanoke darter)	Sa,c,co,p,g,r,d	electroshock	1146s	_
tumetium (swamp) fingernaliclam) s,sa.c.d.m dipnet 0.5h frammi (ubiquifous peaclam) s,sa.c.d.m dipnet 0.5h Offernamicus) acutus (White River envilsh) s,sa.c.d.m dipnet 0.5h seyams (printe peach) s,sa.c.d.m dipnet 0.5h gelosus (varmouth) s,sa.c.d.m dipnet 0.5h gericus (varmouth) s,sa.c.d.m dipnet 0.5h hookii (castem mosquifoffsh) s,sa.c.d.m dipnet 0.5h hookiina (bluegill) s,sa.c.d.m dipnet 0.5h pubudosus (freshwater shrimp) s,sa.c.d.m dipnet 0.5h was columelia (mimic bymmeca) s,sa.c.d.m dipnet 0.5h as columelia (mimic bymmeca) s,sa.c.d.m dipnet 0.5h dam dipnet 0.5h 0.5h dam	w Scartomyzon cervinus (black jumprock)	Sa,c,co,p,g,r,d	electroshock	1146s	
restruction (wamp fingermailclam) s.sa.c.d.m dipnet 0.5h ascetamm (ubiquitions peaclam) s.sa.c.d.m dipnet 0.5h ascetamm (ubiquitions peaclam) s.sa.c.d.m dipnet 0.5h ans gorinase (printe peach) s.sa.c.d.m dipnet 0.5h a macropterus (firet) s.sa.c.d.m dipnet 0.5h a macropterus (firet) s.sa.c.d.m dipnet 0.5h a macropterus (firet) s.sa.c.d.m dipnet 0.5h a fuel form (castern mosquitofish) s.sa.c.d.m dipnet 0.5h a fuel form (castern mosquitofish) s.sa.c.d.m dipnet 0.5h a fuel for (green surfish) s.sa.c.d.m dipnet 0.5h a fuel for (green surfish) s.sa.c.d.m dipnet 0.5h a fuel for (green surfish) s.sa.c.d.m dipnet 0.5h a fuel for (green mosquitofish) s.sa.c.d.m dipnet 0.5h a fuel for (green mulliph) s.sa.c.d.m dipnet 0.5h a sectamum (ubiquitous peaclam) d.m dipnet	ek @ SR 1507				
saa.cd,m dipnet 0.5h ascatanum (whiquitous peaclam) saa.cd,m dipnet 0.5h rus (Ortmamicus) neutus (White River crayfish) s.sa.cd,m dipnet 0.5h rus sayanus (pirate perch) s.sa.cd,m dipnet 0.5h s macropercus (lici) s.sa.cd,m dipnet 0.5h itus glussus (varmouth) s.sa.cd,m dipnet 0.5h hus glorisus (varmouth) s.sa.cd,m dipnet 0.5h is macropercus (lici) s.sa.cd,m dipnet 0.5h is macropic (sector mosquitrish) s.sa.cd,m dipnet 0.5h yanellus (genen surfish) s.sa.cd,m dipnet 0.5h necebirus (hluegill) s.sa.cd,m dipnet 0.5h s. (physa srati) s.sa.cd,m dipnet 0.5h s. (physa srati) s.sa.cd,m					
sex a.c.d.m dipmet 0.5h rus sayanus (pirate perch) s.sa.c.d.m dipmet 0.5h rus salicume (swamp darter) s.sa.c.d.m dipmet 0.5h rus salicume (swamp darter) s.sa.c.d.m dipmet 0.5h yanelus (green surfish) s.sa.c.d.m dipmet 0.5h yanelus (green surfish) s.sa.c.d.m dipmet 0.5h yanelus (green surfish) s.sa.c.d.m dipmet 0.5h p. (n/n) s.sa.c.d.m dipmet 0.5h etc salidaus (buges price) s.sa.c.d.m dipmet 0.5h etc salidaus (buges price) s.sa.c.d.m dipmet 0.5h citas oolumella (mimic lymneca)	hf Musculium partumeium (swamp fingemailclam)	s,sa,c,d,m	dipnet	0.5h	_
ns (Ortmannicus) acutus (White River crayfish) ssac.d.m dipnet 0.5h runs sayanus (printe perch) ssac.d.m dipnet 0.5h tuts galosus (wannouth) ssac.d.m dipnet 0.5h tuts galosus (wannouth) ssac.d.m dipnet 0.5h stoolsus (technoctilis) ssac.d.m dipnet 0.5h holbrookii (eastern mosquitofish) ssac.d.m dipnet 0.5h yandlus (green sunfish) ssac.d.m dipnet 0.5h yandlus (green sunfish) ssac.d.m dipnet 0.5h neus dilataus (freshwater shrimp) ssac.d.m dipnet 0.5h cets paludosus (freshwater shrimp) ssac.d.m dipnet 0.5h cets alibatus (bugle spric) ssac.d.m dipnet 0.5h cets alibatus (freshwater shrimp) ssac.d.m dipnet 0.5h	hf Pisidium casertanum (ubiquitous peaclam)	s,sa,c,d,m	dipnet	0.5h	
ssa,c,d,m dipnet dipnet 0.5h dipnet 0.5h dipnet 0.5h dipnet 0.5h ssa,c,d,m dipnet 0.5h ssa,c,d,m dipnet 0.5h dipnet	hf Procambarus (Ortmannicus) acutus (White River cray		dipnet	0.5h	6
case ocd, m s,sa,c,d,m dipnet 0.5h sts memopherus (flier) s,sa,c,d,m dipnet 0.5h dus gulcoust (warmouth) s,sa,c,d,m dipnet 0.5h stancopherus (redin pickerel) s,sa,c,d,m dipnet 0.5h stancophus (redin pickerel) s,sa,c,d,m dipnet 0.5h stancohine (swamp dater) s,sa,c,d,m dipnet 0.5h vanellus (green sunfish) s,sa,c,d,m dipnet 0.5h vanellus (green sunfish) s,sa,c,d,m dipnet 0.5h vanechina (fluegill) s,sa,c,d,m dipnet 0.5h ets paludusus (freshwater shrimp) s,sa,c,d,m dipnet 0.5h ets paludusus (freshwater shrimp) s,sa,c,d,m dipnet 0.5h dipnet s,sa,c,d,m dipnet 0.5h stance columella (mimic lymaca) s,sa,c,d,m dipnet 0.5h sectamum (ubiquious peadam) d,m dipnet 0.5h d,m d,m dipnet 0.55h					
s, sa, c, d, m dipnet 0.5h trans gulosus (varmouth) s, sa, c, d, m dipnet 0.5h canns (rollin pickeret) s, sa, c, d, m dipnet 0.5h canns (rollin pickeret) s, sa, c, d, m dipnet 0.5h a f sistimer (swand after) s, sa, c, d, m dipnet 0.5h holbrooksi (eastern mosquilofish) s, sa, c, d, m dipnet 0.5h vanetlus (green sunfish) s, sa, c, d, m dipnet 0.5h vanetchins (bluegill) s, sa, c, d, m dipnet 0.5h varetchins (bluegill) s, sa, c, d, m dipnet 0.5h cut spludosus (freshwater shrimp) s, sa, c, d, m dipnet 0.5h cut spludosus (freshwater shrimp) s, sa, c, d, m dipnet 0.5h close a columella (mimic lymaea) s, sa, c, d, m dipnet 0.5h sesta c, d, m d, m dipnet 0.5h d, m d, m d, m d, m d, m d, m d, m d, m d, m d, m	hf Aphredoderus sayanus (pirate perch)	s,sa,c,d,m	dipnet	0.5h	
tus golosous (warmouth) s,sa,c,d,m dipnet 0.5h hers golorous (bluespotted stuffsh) s,sa,c,d,m dipnet 0.5h ricanns (redfin pickerel) s,sa,c,d,m dipnet 0.5h a fistiforme (swamp datter) s,sa,c,d,m dipnet 0.5h vanelus (green sunfish) s,sa,c,d,m dipnet 0.5h vanelus (green sunfish) s,sa,c,d,m dipnet 0.5h p. (r/da) s,sa,c,d,m dipnet 0.5h eus diatatus (bugle sprile) s,sa,c,d,m dipnet 0.5h eus diatatus (bugle sprile) s,sa,c,d,m dipnet 0.5h cinca columella (mimic lymnaca) s,sa,c,d,m dipnet 0.5h sestaculum (ubiquitous peaclam) d,m dipnet 0.5h avertanum (ubiquitous peaclam) d,m dipnet 0.55h	hf Centrarchus macropterus (flier)	s,sa,c,d,m	dipnet	0.5h	5
hus gloriosus (bluespotted sunfish) s.sa.c.d.m dipnet 0.5h ricanus (redfin pickerel) s.sa.c.d.m dipnet 0.5h s sa.c.d.m s.sa.c.d.m dipnet 0.5h yanellus (green sunfish) s.sa.c.d.m dipnet 0.5h yanellus (green sunfish) s.sa.c.d.m dipnet 0.5h raccochinus (bluegill) s.sa.c.d.m dipnet 0.5h res paludosus (freshwater shrimp) s.sa.c.d.m dipnet 0.5h rest paludosus (freshwater shrimp) s.sa.c.d.m dipnet 0.5h rest paludosus (freshwater shrimp) s.sa.c.d.m dipnet 0.5h stes paludosus (freshwater shrimp) s.sa.c.d.m dipnet 0.5h cinca columella (mimic lymnaea) s.sa.c.d.m dipnet 0.5h sectanuum (ubiquitous peaclam) d.m dipnet 0.5h sussectanuum (ubiquitous peaclam) d.m dipnet 0.55h sussayanus (pirate perch) d.m d.m d.m d.m d.m d.m 0.55h	ihf Chaenobryttus guiosus (warmouth)	s,sa,c,d,m	dipnet	0.5h	-
coanus (cedfin pickerel) s,sac,d,m dipnet 0.5h s,sac,d,m s,sac,d,m dipnet 0.5h yanellus (green sunfish) s,sac,d,m dipnet 0.5h yanellus (green sunfish) s,sac,d,m dipnet 0.5h p. (r/a) s,sac,d,m dipnet 0.5h eus dilatus (huge sprite) s,sac,d,m dipnet 0.5h eus dilatus (huge sprite) s,sac,d,m dipnet 0.5h eus dilatus (huge sprite) s,sac,d,m dipnet 0.5h sets paludosus (freshwater shrimp) s,sac,d,m dipnet 0.5h eus dilatus (huge sprite) s,sac,d,m dipnet 0.5h sets adulusus (freshwater shrimp) s,sac,d,m dipnet 0.5h cinca columella (mimic lymnaca) s,sac,d,m dipnet 0.5h sestanum (ubiquitous peaclam) d,m dipnet 0.5h con untal (swampfish) d,m dipnet 0.55h		s,sa,c,d,m	dipnet	0.5h	01
a functionme (ewamp darter) ssac.d.m dipnet 0.5h hobbrookii (eastern mosquitofish) ssac.d.m dipnet 0.5h yanellus (green sunfish) ssac.d.m dipnet 0.5h p. (n/a) ssac.d.m dipnet 0.5h p. (n/a) ssac.d.m dipnet 0.5h etus dilatatus (bugle sprite) ssac.d.m dipnet 0.5h etus dilatatus (bugle sprite) ssac.d.m dipnet 0.5h etus dilatatus (bugle sprite) ssac.d.m dipnet 0.5h ciciea columella (mimic lymnaca) ssac.d.m dipnet 0.5h sestranum (ubiquitous peaclam) d.m dipnet 0.5h rus sayanus (pirate perch) d.m dipnet 0.55h rus sayanus (pirate perch) d.m dipnet 0.55h	011025.2ahf Esox americanus (redfin pickerel)	s,sa,c,d,m	dipnet	0.5h	3
φoltbrookii (castern mosquiofīsh) s,sac,d,m dipnet 0.5h yanellus (green sunfīsh) s,sac,d,m dipnet 0.5h nacrochirus (bluegill) s,sac,d,m dipnet 0.5h p. (n/a) s,sac,d,m dipnet 0.5h ctus galactus (freshwater shrimp) s,sac,d,m dipnet 0.5h ctus dilactus (bugle sprite) s,sac,d,m dipnet 0.5h cinca columella (mimic Jymnaca) s,sac,d,m dipnet 0.5h sestranum (ubiquious peaclam) d,m dipnet 0.5h rus sayanus (pirate perch) d,m dipnet 0.55h rus sayanus (pirate perch) d,m dipnet 0.55h	011025.2ahf Etheostoma fusiforme (swamp darter)	s,sa,c,d,m	dipnet	0.5h	-
yanelus (green sunfish) s.s.a.c.d.m s.s.a.c.d.m 6.5h nacrochirus (bluegil)) s.s.a.c.d.m dipnet 0.5h p. (rVa) s.s.a.c.d.m dipnet 0.5h etes paludosus (freshwater shrimp) d.m	011025.2ahf Gambusia holbrookii (eastern mosquitofish)	s,sa,c,d,m	dipnet	0.5h	
p. (r/da) s,sa,c,d,m dipnet 0.5h p. (r/da) s,sa,c,d,m dipnet 0.5h eus dilataus (bugle sprite) s,sa,c,d,m dipnet 0.5h eus dilataus (bugle sprite) s,sa,c,d,m dipnet 0.5h cinca columella (mimic lymnaca) s,sa,c,d,m dipnet 0.5h ascrtanum (ubiquitous peaclam) d,m dipnet 0.5h rus sayanus (pirate perch) d,m dipnet 0.55h rus sayanus (pirate perch) d,m dipnet 0.55h	ahf Lepomis cyanellus (green sunfish)	s,sa,c,d,m	dipnet	0.5h	_
Po. (n/a) see paludosus (freshwater shrimp) seus dilatatus (bugle sprite) seus dilatatus (bipnet oli	ahf Lepomis macrochirus (bluegill)	s,sa,c,d,m	dipnet	0.5h	10
stes paludosus (freshwater shrimp) etus dilatatus (bugle sprite) b. (physa snail) cinea columella (mimic lymnaea) s,sa,c,d,m s,sa,c,d,m dipnet 0.5h s,sa,c,d,m dipnet 0.5h dipnet 0.5sh	<u>limpet</u> 011025.2ahf Ferrissia sp. (n⁄a)	m,b,o,es,8	dipnet	0.5h	
etus dilatatus (bugle sprite) s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m s,sa,c,d,m dipnet secrtamum (ubiquitous peaclam) asertamum (ubiquitous peaclam) d,m d,m dipnet seromuta (swampfish) d,m d,m dipnet 0.55h dipnet 0.55h dipnet 0.55h dipnet 0.55h dipnet 0.55h	ahf Palaemonetes paludosus (freshwater shrimp)	s,sa,c,d,m	dipnet	0.5h	
s,sa,c,d,m cinea columella (mimic lymnaea) s,sa,c,d,m s,sa,c,d,m dipnet cinea columella (mimic lymnaea) s,sa,c,d,m s,sa,c,d,m dipnet comula (wampfish) s,sa,c,d,m dipnet dipnet comula (wampfish) s,sa,c,d,m dipnet comula (wampfish) d,m dipnet comula (wampfish) s,sa,c,d,m dipnet comula (wampfish) d,m dipnet comula (wampfish) s,sa,c,d,m dipnet comula (wamp	hf Mirompatus diletatus (kunde sorite)	u po es s	dimet	0.5h	
cinca columella (mimic lymnaea) s,sa,c,d,m dipnet 0.5h asertanum (ubiquitous peaclam) d,m dipnet 0.55h dipnet 0.55h dipnet 0.55h dipnet 0.55h dipnet 0.55h dipnet 0.55h	ahf Physella en (nhysa enail)	m p o es s	dinnet	0.5h	
asertanum (ubiquitous peaclam) d,m d,m d,m dipnet 0.55h dipnet 0.55h dipnet 0.55h d,m d,m dipnet 0.55h	ahf Pseudosuccinca columella (mimic lymnaea)	s,sa,c,d,m	dipnet	0.5h	
d,m dipnet 0.55h d,m dipnet 0.55h d,m dipnet 0.55h d,m dipnet 0.55h	@ SR 1124				
dipnet 0.55h d,m d,m dipnet 0.55h dipnet 0.55h	hf Picidium cacedamim (uhiquitais neaclam)	E T	dinnet	0.55h	-
d,m dipnet 0.55h d,m dipnet 0.55h d,m dipnet 0.55h					• 1
d,m dipnet 0.55h dipnet 0.55h	ahf none (n/a)	d,m	dipnet	0.55h	
d,m dipnet 0.55h dipnet 0.55h					
d,m dipnet 0.55h	ahf Aphredoderus sayanus (pirate perch)	d,m	dipnet	0.55h	_
	ahf Chologaster comuta (swampfish)	d,m	dipnet	0.55h	2

Lo	Location		Search		
	Site (date) and species	Substrate	Technique	Time	# Live # Shells
	<u>fish</u>				
	011017.1ahf Elassoma zonatum (banded pygmy sunfish)	d,m	dipnet	0.55h	_
	011017.1ahf Enneacanthus gloriosus (bluespotted sunfish)	d,m	dipnet	0.55h	
	011017.1ahf Etheostoma serrifer (sawcheek darter)	d,m	dipnet	0.55h	3
	011017.1ahf Gambusia holbrookii (eastern mosquitofish)	d,m	dipnet	0.55h	
	<u>shrimp</u> 011017.1ahf Palaemonetes paludosus (freshwater shrimp)	m, p	dinnet	0.55h	
	snail				
	011017.1aht Hydrobiidae (hydrobiid)	d,m	dipnet	0.55h	2
	011017.1ahf Micromenetus dilatatus (bugle sprite)	d,m	dipnet/visual	0.55h	
	011017.1ahf Physella sp. (physa snail)	m'p	dipnet	0.55h	
	Mill Creek @ SR 1185				
	clam				
	011017.3ahf Musculium partumeium (swamp fingernailclam)	m,b,v,s	dipnet	0.93h	
	crayfish				
	011017.3ahf Procambarus (Ortmannicus) acutus (White River crayfish)	m,b,v,s	dipnet	0.93h	7
	011017.3ahf Procambarus (Ortmannicus) medialis (Tar River/Albemarle	m,b,v,s	dipnet	0.93h	7
	fish in the first of the first				
		s,v,d,m	dipnet	0.93h	4
		m,b,v,s	dipnet	0.93h	
	011017.3ahf Elassoma zonatum (banded pygmy sunfish)	s,v,d,m	dipnet	0.93h	
	011017.3ahf Enneaeanthus gloriosus (bluespotted sunfish)	s,v,d,m	dipnet	0.93h	
	011017.3ahf Etheostoma serrifer (sawcheek darter)	w,v,d,m	dipnet	0.93h	3
	011017.3ahf Gambusia holbrookii (eastern mosquitofish)	m,b,v,s	dipnet	0.93h	
	011017.3ahf Notropis cummingsae (dusky shiner)	m,b,v,s	dipnet	0.93h	-
	limpet 011017.3ahf Laevapex fuscus (dusky ancylid)	m,b,v,s	dipnet/visual	0.93h	2
	shrimp		•		
	011017.3ahf Palacmonetes paludosus (freshwater shrimp)	n,v,v,s	dipnet	0.93h	
	snail				
	01101/sahi Campeloma decisum (pointed campeloma)	m,b,v,s	dipnet/visual	0.93h	
	011017.3ahf Micromenetus dilatatus (bugle sprite)	w,b,v,s	dipnet/visual	0.93h	
	011017.3ahf Physella sp. (physa snail)	s,v,d,m	dipnet/visual	0.93h	
	011017.3ahf Pseudosuccinea columella (mimic lymnaea)	s,v,d,m	dipnet/visual	0.93h	4
			- 3 SCHILLSON		

ocation		Search			
Site (date) and species	Substrate	Technique	Time	# Live # Shells	# Shells
Mill Creek @ SR 1185-					
fish first				-	
011128.4btw Gambusia holbrookii (eastern mosquitofish)		electroshock	SC97	=	
011128.4btw Noturus gyrinus (tadpole madtom)		electroshock	265s	_	
<u>shrimp</u> 011128.4btw Palaemonetes paludosus (freshwater shrimp)		electroshock	265s		
Mill Creek @ SR 1201					
clam					^
011016.6ahf Corbicula fluminea (Asian clam)	s,C,d,m	dipnet	1.13h		
011016.6ahf Musculium partumeium (swamp fingernailclam)	s,C,d,m	dipnet	1.13h	-	
<u>crayfish</u> 011016.6ahf Procambarus (Ortmannicus) acutus (White River crayfish)	s,C,d,m	dipnet/dug	1.13h	-	
fish					
011016.6ahf Chologaster cornuta (swampfish)	s,C,d,m	dipnet	1.13h	4	
011016.6ahf Etheostoma fusiforme (swamp darter)	s,C,d,m	dipnet	1.13h	1	
011016.6ahf Gambusia holbrookii (eastern mosquitofish)	s,C,d,m	dipnet	1.13h		
011016.6ahf Lepomis macrochirus (bluegill)	s,C,d,m	dipnet	1.13h	2	
limpet 011016.6ahf Laevapex fuscus (dusky ancylid)	s,C,d,m	dipnet/visual	1.13h		
mussel 011016.6ahf lanceolate Elliptio (lance)	s,C,d,m	dipnet	1.13h	-	
<u>shrimp</u> 011016.6ahf Palaemonetes paludosus (freshwater shrimp)	s,C,d,m	dipnet	1.13h		
<u>snail</u> 011016.6ahf Campeloma decisum (pointed campeloma)	s,C,d,m	dipnet	1.13h	15	
011016.6ahf Hydrobiidae (hydrobiid)	s,C,d,m	dipnet	1.13h		
Polecat Branch @ SR 1007					
<u>clam</u> 011016.4ahf Musculium sp.(partumeium?) (n/a)	M,b,v,s	dipnet	11	4	
craysish 011016.4ahf Procambarus (Ortmannicus) acutus (White River craysish)	M,b,v,s	dipnet	H.	-	
fish .					
011016.4ahf Enncacanthus gloriosus (bluespotted sunfish)	M,b,v,s	dipnet	면 :	2	
U1016-Aahf Gambusta holbrookti (eastern mosquitofish)	N,0,v,8	dipnet	Ξ		

Location Site (date) and species	Substrate	Search Technique	Time	# Live #	#Shells
fish					
U11U16.4ani Umbra pygmaca (castern mudminnow) ebrimn	M,b,v,c	dipnet	ų		
orionity 011016.4ahf Palaemonetes paludosus (freshwater shrimp)	M,b,v,s	dipnet	Ih		
snail 011016.4ahf Pseudosuccinea columella (mimic lymnaea)	W,b,v,s	dipnet/visual	4	2	-
Polecat Branch @ SR 1007-					
fish					
011128.60tw Enneacantinus giornosus (bluespotted sunfish) 011128.6btw Gambusia holbrookii (eastern mosquitofish)		electroshock electroshock	195s 195s	į,	
shring					
011128.6btw Palaemonetes paludosus (freshwater shrimp)		electroshock	1958		
Stone Creek @ SR 1138					
clam	· ·				
011017.2ahf Musculium sp. (n/a)	s,sa,v,d,m	dipnet	I.		
crayfish 011017 2ahf Pricambanis (Ortmannicus) acutus (White River cravifish)	***************************************		;		
fish	0,04,7,4,111	naudin	=		
011017.2ahf Aphredoderus sayanus (pirate perch)	s,sa,v,d,m	dipnet	4		
011017.2ahf Elassoma zonatum (banded pygmy sunfish)	s,sa,v,d,m	dipnet	H.		
011017.2ahf Enneacanthus gloriosus (bluespotted sunfish)	s,sa,v,d,m	dipnet	ų.		
011017.2ahf Etheostoma serrifer (sawcheek darter)	s,sa,v,d,m	dipnet	ЧI	-	
011017.2ahf Gambusia holbrookii (eastern mosquitofish)	s,sa,v,d,m	dipnet	ЧI		
<u>shrimp</u> 011017.2ahf Palaemonetes paludosus (freshwater shrimp)	m,b,v,es,s	dipnet	, C.	4.5	
Snail 0110172ahf Physella sn (ahysa snail)	1	•	;	!	
011017.2ahf Pseudosuccinea columella (mimic lymnaea)	S,Sa,V,Q,M	dipnet/visual	를 :	,	
Clamp Carel, @ Ch 1130		ciplice visual	=	c	
cravitsh					
011128.3btw Procambarus (Ortmannicus) acutus (White River crayfish)		electroshock	2628		
fish					
		electroshock	262s	Service a service	
011128.3btw Centrarchus macropterus (flier)		electroshock	262s	1	
011128.3btw Enneacanthus gloriosus (bluespotted sunfish)		electroshock	262s	-	
	ů.				

Location		Search			
Site (date) and species	Substrate	Technique	Time	# Live # Shells	<u>s</u>
fish					
011128.3btw Erimyzon oblongus (creek chubsucker)		electroshock	262s		
011128.3btw Esox americanus (redfin pickerel)		electroshock	262s	2	
011128.3btw Gambusia holbrookii (eastern mosquitofish)		electroshock	262s		
shrimp		1	-636		
011128.3btw Palaemonetes paludosus (freshwater shrimp)		electrosnock	\$797		
Swift Creek @ NC 210-					
Clan	S	snorkel	3.5h		
cravfish				-	
010802.2btw none (n/a)	Sa, c, d		3.5h		
fish					
010802.2btw Ameiurus catus (white catfish)	Sa, c, d	snorkel	3.5h		
010802.2btw Cyprinella analostana (satinfin shiner)	Sa, c, d	snorkel	3.5h		
010802.2btw Etheostoma nigrum/olmstedi (johnny/tessellated darter)	Sa, c, d	snorkel	3.5h		
010802.2btw Gambusia holbrookii (eastern mosquitofish)	Sa, c, d	snorkel	3.5h		
010802.2btw Lythrurus matutinus (pinewoods shiner)	Sa, c, d	snorkel	3.5h		
010802.2btw Percina peltata (shield darter)	Sa, c, d	snorkel	3.5h		
<u>mussel</u>					
010802.2btw Elliptio complanata (eastern Elliptio)	Sa, c, d	snorkel	3.5h	13 5	
010802.2btw Elliptio congaraca (Carolina slabshell)	Sa, c, d	snorkel	3.5h	_	
010802.2btw Elliptio icterina (variable spike)	Sa, c, d	snorkel	3.5h		
010802,2btw Elliptio lanceolata (yellow lance)	Sa, c, d	snorkel	3.5h	_	
Snail					
010802.2btw none (n/a)	Sa, c, d		3.5h		
Swift Creek @ SR 1501-					
clam 011128.7btw Corbicula fluminea (Asian clam)	Sa, c, r, d	Visual			
crayfish					
011128.7btw none (n/a)	Sa, c, r, d				
fish.					
011128.7btw Anguilla rostrata (American eel)	Sa, c, r, d	electroshock	e56s		
011128.7btw Cyprinella analostana (satinfin shiner)	Sa, c, r, d	electroshock	e56s	2	
011128.7btw Etheostoma nigrum/olmstedi (johnny/tesselated darter)	Sa, c, r, d	electroshock	s9 5 9		
011128.7btw Hybognathus regius (eastern silvery minnow)	Sa, c, r, d	clectroshock	9599	_	
011128.7btw Hypentelium nigricans (northern hogsucker)	Sa, c, r, d	electroshock	e56s	_	
	OC.				

Location		Search			
Site (date) and species	Substrate	Technique	Time	# Live # Shells	ells
lish had a second secon					
011128.7btw Ictalurus punctatus (channel catfish)	Sa, c, r, d	electroshock	656s 1		
011128.7btw Lepomis auritus (redbreast sunfish)	Sa, c, r, d	electroshock	6568		
011128.7btw Lepomis macrochirus (bluegill)	Sa, c, r, d	electroshock	6568		
011108.7btw Lythrurus matutinus (pinewoods shiner)	Sa, c, r, d	electroshock	6568		
011128.7btw Nocomis leptocephalus (bluehead chub)	Sa, c, r, d	electroshock	656s		
011128.7btw Luxilus albeolus (white shiner)	Sa, c, r, d	electroshock	9959		
011128.7btw Percina roanoka (Roanoke darter)	Sa, c, r, d	electroshock	6568		
011128.7btw Pylodictis olivaris (slathead catsish)	Sa, c, r, d	clectroshock	656s	_	
<u>mussel</u> 011128.7btw Elliptio complanata (eastern Elliptio)	Sa, c, r, d	visual		2	
Swift Creek @ SR 1525-					
clam					
011025.5ahf Corbicula fluminea (Asian clam)	S,sa,d,M	dipnet	=		
crayfish					
011025.5ahf Procambarus (Ortmannicus) acutus (White River crayfish)	s,sa,d,M	dipnet	H	12	
011025.5ahf Unknown (n/a)	s,sa,d,M	dipnet	_	2	
fish.				ŕ	
011025.5ahf Chaenobryttus gulosus (warmouth)	s,sa,d,M	dipnet	4	-	
011025.5ahf Enneacanthus gloriosus (bluespotted sunfish)	s,sa,d,M	dipnet	4		
011025.5ahf Etheostoma nigrum/olmstedi (johnny/tesselated darter)	s,sa,d,M	dipnet	: <u>=</u>	, v	
011025.5ahf Gambusia holbrookii (eastern mosquitofish)	M,b,es,s	dinnet	=)	
\overline{shrimp} 011025.5ahf Palaemonetes paludosus (freshwater shrimp)	s,sad,M	dipnet	=		
snail					
011025.5ahf Hydrobiidae (hydrobiid)	N,b,as,s	dipnet	프	4	
011025.5ahf Micromenetus dilatatus (bugle sprite)	s,sa,d,M	dipnet	무	_	
011025.5ahf Physella sp. (physa snail)	s,sa,d,M	dipnet	1.h	4	
Swift Creek @ SR 1555 to SR 1643					
	c,s,sa,g,co,	visual	2h	wood	
	s,sa,Co,g	visual		-	
	c,S,sa,g	visual			
	c,s,sa,g,co,	visual	2h	51	
	c,s,Sa,G	visual	0.67h	2	
010921.1jaj Elliptio spp. (n/a)	c,s,sa,g,co,	visual	2h	187	

Location Site (date) and enocioe	Substrate	Search Technique	Time	# Live	#Live #Shells
mussel					
010921.2jaj Elliptio spp. (n/a)	c,s,Sa,G	visual	0.67h	23	
010921.3jaj Elliptio spp. (n/a)	s,sa,Co,g	visual			
lians					
010921.2jaj Campeloma decisum (pointed campeloma)	c,s,Sa,G	visual	0.67h		
010921.3jaj Elimia catenaria (gravel climia)	s,sa,Co,g	visual			
Swift Creek @ SR 1562-					
fish					
011105.1btw Ameiurus platycephalus (flat bullhead)		electroshock	532s	-	•
011105.1btw Anguilla rostrata (American eel)		electroshock	532s	-	
011105.1btw Chaenobryttus gulosus (warmouth)		electroshock	532s	3	
011105.1btw Cyprinella analostana (satinfin shiner)		electroshock	532s		
011105.1btw Etheostoma nigrum/olmstedi (johnny/tesselated darter)		electroshock	532s		
011105.1btw Gambusia holbrookii (eastern mosquitofish)		electroshock	532s		
011105.1btw Lepomis auritus (redbreast sunfish)		electroshock	532s		
011105.1btw Lepomis macrochirus (bluegill)		electroshock	532s		
011105.1btw Notropis procne (swallowtail shiner)		electroshock	532s		
011105.1btw Percina roanoka (Roanoke darter)		electroshock	532s		
mussel					
011105.1btw Corbicula fluminea (Asian clam)		visual			
Swift Creek @ SR 1562-/+					
Clam					
011105.2btw Corbicula fluminea (Asian clam)	Sa,co,p,g,d	visuai			
craylish	-	-	040	•	
UIIIOS.Zbtw Cambarus (Functicambarus) sp. C (17a) fish	5a,co,p,g,d	CICCHOSHOCK	8076	-	
011105.2btw Ameiurus platycephalus (flat bullhead)	Sa,co,p,g,d	electroshock	940s	-	
011105.2btw Anguilla rostrata (American eel)	Sa,co,p,g,d	electroshock	940s	3	
011105.2btw Aphredoderus sayanus (pirate perch)	Sa,co,p,g,d	clectroshock	940s	-	
011105.2btw Etheostoma flabellare (fantail darter)	Sa,co,p,g,d	electroshock	940s		
011105.2btw Etheostoma nigrum/olmstedi (johnny/tesselated darter)	Sa,co,p,g,d	electroshock	940s		
011105.2btw Hypentelium nigricans (northern hogsucker)	Sa,co,p,g,d	electroshock	940s		
011105.2btw Lepomis auritus (redbreast sunfish)	Sa,co,p,g,d	electroshock	940s		
011105.2btw Lepomis macrochirus (bluegill)	Sa,co,p,g,d	electroshock	940s	3	
011105.2btw Luxilus albcolus (white shiner)	Sa,co,p,g,d	clectroshock	940s	3	

Location			Search		
Site (da	Site (date) and species	Substrate	Technique	Time	# Live # Shells
fish					
011105.2btw	011105.2btw Moxostoma collapsum (v-lip redhorse)	Sa,co,p,g,d	electroshock	940s	wood
011105.2btw	011105.2btw Nocomis leptocephalus (bluehead chub)	Sa,co,p,g,d	electroshock	940s	
011105.2btw	011105.2btw Noturus insignis (margined madtom)	Sa,co,p,g,d	clectroshock	940s	4
011105.2btw	011105.2btw Percina peltata (shield darter)	Sa,co,p,g,d	electroshock	940s	_
011105.2btw	011105.2btw Percina roanoka (Roanoke darter)	Sa,co,p,g,d	electroshock	940s	
011105.2btw	011105.2btw Scartomyzon cervinus (black jumprock)	Sa,co,p,g,d	electroshock	940s	3
<u>mussel</u> 011105.2btw	<u>mussel</u> 011105.2btw Elliptio complanata (eastern Elliptio)	Sa,co,p.g.d	visual		-

Table 3. Historical records of aquatic species found in Johnston County during previous aquatic inventories conducted by NC Wildlife period, but does not necessarily mean that animals do not occur at the site. Also note that all taxa were not necessarily surveyed at each site (surveys were conducted primarily for freshwater mussels). Substrates, where given, are defined as follows, with dominant substrates Resources Commission staff and colleagues. Records where "none" was recorded indicate that no animals were observed during the search capitalized: b=bedrock, b=boulder, c=clay, co=cobble, d=detritus, g=gravel, m=mud, p=pebble, r=roots, s=silt, sa=sand, v=vegetation.

Location			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	# Shells
Bernal Branch @ SR 1229					
000707.3tws none (n/a)				0	
Black Creek @ SR 1330+					
mussel 010615 1ima Ellintio companata (eastern Fllintio)			0.5h		
910515.1jma Elliptio icterina (variable spike)			0.5h		
Buffalo Creek @ NC 96					
ciam 980604.1jaj Corbicula fluminea (Asian clam)	c,s,Sa,G,co,bo	tactile	#		
mussel					
980604.1jaj none (n/a)	c,s,Sa,G,co,bo	tactile	#		
Buffalo Creek @ SR 1941-					
mussel			:	\$	
980618.1jaj Elliptio spp. (n/a)	C,S,sa,G	tactile	£	09	
Buffalo Creek @ SR 2129					
mssel					
980603.6jaj Elliptio spp. (n/a)	r,c,s,Sa	tactile	0.27h	&	
980603.7jaj Elliptio spp. (n/a)	r,C,s,Sa,G,b	tactile	2h	348	
980603.6jaj lanceolate Elliptio (lance)	r,c,s,Sa	tactile	0.27h	-	
980603.7jaj lanceolate Elliptio (lance)	r,C,s,Sa,G,b	tactile	2h	9	
Buffalo Creek @ SR 2130					
clam					
980603.5jaj Corbicula fluminea (Asian clam)	r,C,S,sa,g		4h		
<u>mussel</u> 080603 fisi Alaemidanta heteradan (Awarf wodnemissel)	, es y J	tactile	4	_	,
COCCOSTATION CONTRACTOR CONTRACTO	9::::::::::::::::::::::::::::::::::::::		: =	. 416	t
960003.3Jaj Enipuo Spp. (IVa)	L'C,S,Sa,B	ומכוווכ	Ŧ	<u>.</u>	
	.,				

Location Site (date) and species	Substrate	Technique	Search Time	# Live	# Shells
mussel 980603. Sjaj lanceolate Elliptio (lance)	r,C,S,sa,g	tactile	4	∞	-
snail 980603.5jaj Campeloma sp. (n/a)	r,C,S,sa,g		44		
980603.5jaj Pianorbidae (n/a)	1,C,S,sa,g		44		
Buffalo Creek @ SR 2130-					
980618.2jaj Elliptio spp. (n/a)	8,88,8	visual	1.33h	227	
980618.2jaj lanceolate Elliptio (lance)	Sysae	visual	1.33h	5	
Buffalo Creck @ SR 2130+					
mussel					
980825.1jaj Alasmidonta unduiata (mangte itoater)		Visual			w-q
980825.1jaj Elliptio spp. (n/a)		visual			
980825.1jaj lanceolate Elliptio (lance)		visual		S	
Cattail Creek @ NC 96+					
mussel	•				
980318.2Jaj none (rva)	c,s,Sa,C,co		1.25h		
Cattail Creek @ SR 1700-					
980518.3jaj Elliptio spp. (n/a)	r,c,S,Sa,g	tactile	2.75h	9	
980518.3jaj lanceolate Elliptio (lance)	1,c,S,Sa,g	tactile	2.75h	yazai	
snail					
980518.3jaj Campeloma sp. (n/a)	r,c,S,Sa,g		2.75h		
980518.3jaj Helisoma anceps (two-ridge rams-hom)	r,c,S,Sa,g		2.75h		
Copper Branch @ SR 1563					
960523.3jma Elliptio spp. (n/a)			0.7h	4	
Ditch near E Buffalo Creek @ NC 42					
crayfish 920403.2cmg Procambarus (Ortmannicus) medialis (Tar River/Albemarle					
Hannah Creek @ NC 96					

mussel 000707.2tws none (n/a)

Location			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	Shells
Hannah Creek @ SR 1009-/+					
mussel					
910828.2jma Elliptio spp. (n/a)			1.5h		
Hannah Creek @ SR 1171					
mussel					
980820.1tws none (n/a)		snorkel	0.5h	0	
Juniper Swamp/Juniper Swamp Trib @ I-95					
mussel					*
940525,2tws none (n/a)			0.5h	0	•
Little Creek @ SR 1001				v	
crayfish					
980603.4jaj Procambarus sp. (1/a)	c,S,sa,g	visual	0.33h		
mussel					
980603.4jaj none (n/a)	c,S,sa,g	tactile	0.33h		
Little Creek @ SR 1562					
clam					
940525.4tws Corbicula fluminea (Asian clam)	ου.		0.5h		
mussel					
940525.4tws Elliptio spp. (n/a)	50		0.5h	21	
Little Creek @ SR 2141					
mussel					
980603.3jaj none (n/a)	s,Sa,G	tactile	0.67h		
Little River @ n/a					
clam					
830712.2024ahc Corbicula fluminea (Asian clam)	s,sa,det	visual	1.3h	4	
mussel				3	,
	s,sa,det	Visual	1.3h	4	•
830712.2024ahc Elliptio steinstansana (Tar spinymussel)	s,sa,det	visual	1.3h	_	
snail			č	ć	
830/12.2024ahc Campeloma decisum (pointed campeloma)	s,sa,det	Visual	uc. :	7 -	
830/12.2024ahc Lioplax subcarinata (ridged lioplax)	s,sa,det	visual	l.3h	_	

Location Site (date) and species	Substrate	Technique	Search Time	# Live	# Live # Shells
I ittle Biwer Trih @ SR 1723					
mussel					
980520.5jaj Elliptio spp. (1/a)	c,s,Sa,g	tactific	0.25h	∞	
Little River @ NC 231					
961015.1tws Elliptio spp. (n/a)	n/a	snorkel	Comme August Suare	80	
Little River @ NC 231-				*	
980709. Jiaj Alasmidonta undulata (triangle floater)	c,S,Sa,g	tactife	3.35h	m	
980709. ijaj Elliptio spp. (n/a)	c,S,Sa,g	tactific.	3.35h	252	
Little River @ NC 231+					
Ciam Corbicula fluminea (Asian clam)	C.s. Sarg		e e		
980714.3jaj Corbicula fluminea (Asian clam)	d,od,ss,S,s,w		2.25h		
mussel 980714 3isi Atsemidonta undulata (trianole floater)	w S sa bo	00000	2.25h	647)	
	C,s,Sa,g	· taotile	2h	274	
980714.3jaj Elliptio spp. (n/a)	w,c,S,sa,bo,b	tactile	2.25h	794	
980714.2jaj lanceolate Elliptio (lance)	C,s,Sa,g	tactife	242	sensi	
980714.3jaj lanceolate Elliptio (lance)	w,c,S,sa,bo,b	tactile	2.25h	S	
snail					
980714.2jaj Campeloma sp. (n/a)	C,s,Sa,g		2h		
980714.3jaj Campeloma sp. (n/a)	w,c,S,sa,bo,b		2.25h		
Little River @ NC 39 to NC 42					
980710.2jaj Corbicula fluminea (Asian clam)	r,C,s,sa		25.		
mussel					
980710.3jaj Alasmidonta undulata (triangle floater)	C,s,sa	tactile		was	
980710.2jaj Elliptio spp. (n/a)	r,C,s,sa	tactile	1.5h	617	
980710.3jaj Elliptio spp. (1/a)	C,s,sa	taciile		3	
980710.2jaj lanceolate Elliptio (lance)	r,C,s,sa	tactile	I.Sh	1	
980710.3jaj lanceolate Elliptio (fance)	C,s,sa	tactile		25	A Systems
980710.3jaj Pyganodon cataracta (eastern floater)	C,s,sa	tactife		gum	

Location Site (date) and species	Substrate	· Technique	Search Time	# Live # Shells	Shells
snail 980710.2jaj Campeloma sp. (10/a)	r,C,s,sa		1.5h		
Little River @ NC 39/SR 2123					
890724, lima Alasmidonta undulata (triangle floater)			0.7h	4	
890724.1 jma Elliptio complanata (eastern Elliptio)			0.7h	118	
890724.1 jma Elliptio icterina (variable spike)			0.7h		
890724.1jma Fusconaia masoni (Atlantic pigtoe)			0.7h 47.0	V	e.
890/24.1Jma Suropintus unduratus (creeper)				-	٠
Little River @ NC 39+					
980720.5jaj Alasmidonta undulata (triangle floater)	w,c,S,b	tactile	2h	2	
980720.4jaj Elliptio spp. (n/a)	w,c,s	tactile	1.67h	338	
980720.5jaj Elliptio spp. (n/a)	w,c,S,b	tactile	2h	1005	
980720.4jaj lanceolate Elliptio (lance)	w,c,s	tactile	1.67h	10	
980720.5jaj lanceolate Elliptio (lance)	w,c,S,b	tactile	2h	7	
980720.3jaj none (n/a)					
980720.5jaj Villosa constricta (notched rainbow)	w,c,S,b	tactile	2h	_	
Little River @ NC 42					
mussel					
890908.2jma Alasmidonta heterodon (dwarf wedgemussel)			표		-
890908.2jma Alasmidonta undulata (triangle floater)			Ч	-	
890908.2jma Elliptio spp. (1/a)			=	100	
970623.2jaj Elliptio spp. (n/a)	S,Sa,G,bo	tactile	0.5h	137	
890908.2jma Lampsilis cariosa (yellow lampmussel)			Ч	-	
890908.2jma lanceolate Elliptio (lance)			Ч		
970623.2jaj lanceolate Elliptio (lance)	S,Sa,G,bo	tactile	0.5h	-	
890908.2jma Pyganodon cataracta (eastern floater)			띺		
970623.2jaj Pyganodon cataracta (eastern floater)	S,Sa,G,bo	tactile	0.5h	-	
890908.2jma Strophitus undulatus (creeper)			=		
890908.2jma Utterbackia imbecillis (paper pondshell)			=		
890908.2jma Villosa constricta (notched rainbow)			Ч	-	
970623.2jaj Villosa constricta (notched rainbow)	S,Sa,G,bo	tactile	0.5h	-	

Location			Search	
Site (date) and species	Substrate	Technique	Time	# Live # Shells
Little River @ NC 42-				
mssel				
900925.2jma Elliptio complanata (castern Elliptio)			Пh	
900925.2jma Elliptio icterina (variable spike)			lh	
900925.2jma Fusconaia masoni (Atlantic pigtoe)			Ih.	_
900925.2jma lanceolate Elliptio (lance)			th	10
900925.2jma Pyganodon cataracta (eastern floater)			I.h	5
900925.2jma Strophitus undulatus (creeper)			Пh	01
900925.2jma Utterbackia imbecillis (paper pondshell)			Ih	-
Little River @ NC 96-				
mussel				
980708.4jaj Elliptio spp. (n/a)	C,s,Sa,g,Co,bo,b	tactile	2.33h	597
980708.4jaj lanceolate Elliptio (lance)	C,s,Sa,g,Co,bo,b	tactile	2.33h	91
980708.4jaj Villosa constricta (notched rainbow)	C,s,Sa,g,Co,bo,b	tactile	2.33h	-
Little River @ NC 96+				
mussel				
980/08.2jaj Alasmidonta heterodon (dwarf wedgemussel)	R,C,s,Sa	tactile	1.5h	_
980708.2jaj Elliptio spp. (n/a)	R,C,s,Sa	tactile	1.5h	86
980708.2jaj lanceolate Elliptio (lance)	R,C,s,Sa	tactile	1.5h	13
Little River @ SR 1001				
clam				
980810.1jaj Corbicula fluminea (Asian clam)	w,S,co,B		0.33h	
mussel				
980810.1jaj Elliptio spp. (n/a)	w,S,co,B	tactile	0.33h	4
	s,sa,co	tactile	0.75h	94
	r,w,c,s,sa	tactile	1	11.7
980810.4jaj Elliptio spp. (n/a)	r,w,C,s,sa,co	tactile	1.33h	143
980810.2jaj lanceolate Elliptio (lance)	s,sa,co	tactile	0.75h	_
980810.3jaj lanceolate Elliptio (lance)	r,w,c,s,sa	tactile	11	4
980810.4jaj lanceolate Elliptio (lance)	r,w,C,s,sa,co	tactile	1.33h	
980810.4jaj Strophitus undulatus (creeper)	r,w,C,s,sa,co		1.33h	_
snail				
980810.1jaj Campeloma sp. (n/a)	w,S,co,B	•	0.33h	

ocation			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	60 l
Little River @ SR 1002 to SR 2557					
<u>clam</u> 980804.4jaj Corbicula fluminea (Asian clam)	S,Sa,g	visual			
	S,Sa,g	visual			
	S,Sa,g	visual		_	
980804.4jaj Utterbackia imbecillis (paper pondshell)	S,Sa,g	visual		_	
Little River @ SR 1722-				•	
980707.2jaj Corbicula fluminea (Asian clam)	C,S,Sa,bo		1.75h		
mussel		;			
980707.2jaj Elliptio spp. (n/a)	C,S,Sa,bo	tactile	1.75h	251	
980707.2jaj Fusconaia masoni (Atlantic pigtoe)	C,S,Sa,bo	tactile	1.75h 1.751	_ <	
980707.2jaj lanceolate Elliptio (lance)	C,S,Sa,bo	tactile	l./sh	×	
<u>snail</u> 980707.2jaj Campeloma sp. (n/a)	C,S,Sa,bo		1.75h		
Little River @ SR 1722 -					
<u>lassum</u>			0 :	Ç	
950921.3jma Elliptio spp. (n/a)			щ.	89	
Little River @ SR 1722+					
980707.4jaj Corbicula fluminea (Asian clam)	c,s,Sa		1.5h		
mussel	5			ē	
980/0/4gaj Elliptio spp. (n/a)	C, s, Va	tactife	nc.1	5 =	
500/01.4Jaj ianeconate Empto (rance)	C,3,3a	raction	110.1	=	
980707.4jaj Campcloma sp. (n/a)	c,s,Sa		1.5h		
Little River @ SR 1733-					
cram 980715.3jaj Corbicula fluminea (Asian clam)	w,C,s,g		0.5h		
mnssel					
	w,C,S,g,Co	tactile	묘	96	
980715.3jaj Elliptio spp. (n/a)	w,C,s,g	tactile	0.5h	81	

Location			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	ells
<u>nussel</u>					
980715.2jaj lanceolate Elliptio (lance)	w,C,S,g,Co	tactile	4	_	
980715.3jaj lanceolate Elliptio (lance)	w,C,s,g	tactile	0.5h	_	
<u>snail</u>	Ç. so		;		
२०७७ । उ.स्ब्री - ट्यााप्रिटाशांव sp. (१७४) 980715.3iai - Campeloma sp. (१७४)	w,c,s,g,co w.C.s.g		0.5h		
	2				
Little River (a) SR 1733+ muscol					
980709.3jaj Elliptio spp. (n/a)	r,C,s,sa,Co	tactile	౼	3.	
Little River @ SR 1934-					
clam					
980729.3jaj Corbicula fluminea (Asian clam)	r,C,s		1.5h		
nussel					
980729.3jaj Alasmidonta undulata (triangle floater)	r,C,s	tactile	1.5h		_
980729.3jaj Elliptio spp. (n/a)	r,C,s	tactile	1.5h	601	
980729.3jaj lanceolate Elliptio (lance)	r,C,s	tactile	1.5h	٣	
980729.2jaj Strophitus undulatus (creeper)	r,Sa,g,co,b	visual			_
980729.3jaj Strophitus undulatus (creeper)	r,C,s	tactile	1.5h		
980729.3jaj Villosa constricta (notched rainbow)	1,C,s	tactile	1.5h		_
snail 980729.3jaj Campeloma sp. (n/a)	r,C,s		1.5h		
Little River @ SR 1934+					
clam					
980730.1jaj Corbicula fluminea (Asian clam)	c,S,Co		1.5h		
980730.2jaj Corbicula fluminea (Asian clam)	c,s,sa,g		0.75h		
	c,S,Co	tactile	1.5h	2	
980730.1jaj Elliptio spp. (n/a)	c,S,Co	tactile	1.5h	353	
980730.2jaj Elliptio spp. (1/a)	c,s,sa,g	tactile	0.75h	157	
980730.1jaj lanceolate Elliptio (lance)	c,S,Co	tactile	1.5h	12	
980730.2jaj lanceolate Elliptio (lance)	C,S,Sa,B	tactile	0.75h	3	
980730.1jaj Strophitus undulatus (creeper)	c,S,Co	tactile	1.5h	1	
snail					
980730.1jaj Campeloma sp. (rv/a)	c,S,Co		1.5h		
980730.2jaj Campeloma sp. (n/a)	c,s,sa,g		0.75h		
	40				

Location			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	# Shells
Little River @ SR 2123-					
clam	4		i i		
980715.5jaj Corbicula fluminea (Asian clam)	R,C,S,sa,g,co		1.75h		
mussel					
980715.5jaj Elliptio spp. (n/a)	R,C,S,sa,g,co	tactile	1.75h	9/	
980715.6jaj Elliptio spp. (n/a)	r,w,s	tactile	0.75h	101	
980715.Siaj lanceolate Elliptio (lance)	R,C,S,sa,g,co	tactile	1.75h	4	
980715.6jaj lanceolate Elliptio (lance)	ľ,w,s	tactile	0.75h	3	
	R,C,S,sa,g,co	tactile	1.75h		2,
snail					
980715.5jaj Campeloma sp. (n/a)	R,C,S,sa,g,co		1.75h		
Little River @ SR 2123+					
clam					
980720.1jaj Corbicula fluminea (Asian clam)	C,s,sa,g,Co		2.13h		
980720.2jaj Corbicula fluminea (Asian clam)	C,s,sa,Co		1.67h		
mussel					
980720. Ljaj Elliptio spp. (n/a)	C,s,sa,g,Co	tactile	2.13h	121	
980720,2jaj Elliptio spp. (n/a)	C,s,sa,Co	tactile	1.67h	102	
980720.1jaj lanceolate Elliptio (lance)	C,s,sa,g,Co	tactile	2.13h	3	
snail					
980720.1jaj Campeloma sp. (n/a)	C,s,sa,g,Co		2.13h		
980720.2jaj Campeloma sp. (n/a)	C,s,sa,Co		1.67h		
980720.2jaj Elimia catenaria (gravel elimia)	C,s,sa,Co		1.67h		
Little River @ SR 2127					
$\frac{clam}{980721.3iai}$ Corbicula fluminea (Asian clam)	S,sa,g,Co		34		
mussel					
980721.3jaj Elliptio spp. (n/a)	S,sa,g,Co	tactile	3h	467	
980721.3jaj lanceolate Elliptio (lance)	S,sa,g,Co	tactile	34	∞	
980721.3jaj Villosa constricta (notched rainbow)	S,sa,g,Co	tactile	3h	-	
snail					
980721.3jaj Campeloma sp. (n/a)	S,sa,g,Co		3h		

Location City (1942) and analysis	Cubetrate	Tachniqua	Search	# Live # Shells	2
one (date) and species	Substrate	ACHINA	ATTE	TOTAL III	
Little River @ SR 2127-					
clam					
980721.1jaj Corbicula fluminea (Asian clam)	S,g,co				
980721.2jaj Corbicula fluminea (Asian clam)	r,S		1.33h		
mussel					
980721.1jaj Elliptic spp. (n/a)	8,5,00	tactile			
980721.2jaj Elliptio spp. (n/a)	r,S	tactile	1.33h	119	
980721.2jaj lanceolate Elliptio (lance)	r,S	tactile	1.33h	4	
Snail				ř.	
980721.1jaj Campeloma sp. (n/a)	8,8,00				
980721.2jaj Campeloma sp. (n/a)	r,S		1.33h		
Little River @ SR 2127+					
clam					
980721.4jaj Corbicula fluminea (Asian clam)	s,Sa,g,co,b				
mussel					
980721.5jaj Alasmidonta undulata (triangle floater)	r,c,s,sa,B	tactile	2.25h	-	
980721.6jaj Alasmidonta undulata (triangle floater)	r,c,S,g,Co,b	tactile	2.25h	2	
980721.4jaj Elliptio spp. (n/a)	s,Sa,g,co,b	visual			
980721.Sjaj Elliptio spp. (n/a)	r,c,s,sa,B	tactile	2.25h	351	
980721.6jaj Elliptio spp. (n/a)	r,c,S,g,Co,b	tactile	2.25h	475	
980721.5jaj lanceolate Elliptio (lance)	r,c,s,sa,B	tactile	2.25h	7	
980721.6jaj lanceolate Elliptio (lance)	r,c,S,g,Co,b	tactile	2.25h	2	
980721.5jaj Utterbackia imbecillis (paper pondshell)	r,c,s,sa,B	tactile	2.25h	-	
snail 980721.4jaj Campeloma sp. (n/a)	s.Sa.g.co.b				
Little River @ SR 2129					
clam					
980601.2jaj Corbicula fluminea (Asian clam)	C,s,sa,g		2h		
mussel					
980601.2jaj Elliptio spp. (n/a)	C,s,sa,g	tactile	2h	353	
980601.2jaj lanceolate Elliptio (lance)	C,s,sa,g	tactilc	2h		
980601.2jaj Villosa constricta (notched rainbow)	C,s,sa,g	tactile	Zh	_	

Location		Substate	Technique	Search	F evi I #	#Shells
Site (da)	Site (date) and species	Substrate	anhiiiii a			CILCUIS
Little River @ SR 2129+	D SR 2129+					
clam						
980728.1jaj	980728.1jaj Corbicula fluminea (Asian elam)	Sa,g,co,b				
980728.2jaj	Corbicula fluminea (Asian clam)	r,w,C,s,sa		1.55h		
mussel						
980728.1jaj	980728.1jaj Elliptio spp. (n/a)	Sa,g,co,b	visual/tactile			
980728.2jaj	Elliptio spp. (n/a)	r,w,C,s,sa	tactile	1.55h	212	
980728.2jaj	980728.2jaj lanceolate Elliptio (lance)	r,w,C,s,sa	tactile	1.55h		_
snail						-
980728.2jaj	980728.2jaj Campeloma sp. (n⁄a)	r,w,C,s,sa		1.55h		
Little River @ SR 2130-	a) SR 2130-					
clam						
980722.2jaj	980722.2jaj Corbicula fluminea (Asian elam)	C,s,sa,g,co		6.75h		
mussel						
980722.2jaj	980722.2jaj Alasmidonta undulata (triangle floater)	C,s,sa,g,co	tactile	6.75h		-
980824.1jaj	Alasmidonta undulata (triangle floater)	s,c,sa,g,eo,r,det	tactile	49	3	
980824.2jaj	Alasmidonta undulata (triangle floater)	sa,G	visual/tactile	2.33h	-	
980722.1jaj	Elliptio lanceolata (yellow lance)	r,w,s,Sa,G,co,b	tactile/visual			2
980722.2jaj	Elliptio lanceolata (yellow lance)	C,s,sa,g,co	tactile	6.75h		4
980824.1jaj	Elliptio lanceolata (yellow lance)	s,e,sa,g,eo,r,det	tactile	49	-	4
980824.2jaj	Elliptio lanceolata (yellow lance)	sa,G	visual/tactile	2.33h	4	
980722.1jaj	Elliptio spp. (n/a)	r,w,s,Sa,G,co,b	tactile/visual		172	
980722.2jaj	Elliptio spp. (n/a)	C,s,sa,g,co	tactile	6.75h	1042	
980824.1jaj	Elliptio spp. (n/a)	s,e,sa,g,co,r,det	tactile	49	819	
980824.2jaj	Elliptio spp. (n/a)	sa,G	visual/tactile	2.33h	86	
980825.2jaj	Elliptio spp. (n/a)	s,C,sa,g	tactile	0.85h	108	
980825.3jaj	Elliptio spp. (n/a)	S,c,sa,g,co	tactile	1.3h	139	
980824.2jaj	Elliptio steinstansana (Tar spinymussel)	sa,G	visual/tactile	2.33h	_	
980722.1jaj	Fusconaia masoni (Atlantic pigtoe)	r,w,s,Sa,G,eo,b	tactile/visual			2
980722.2jaj	Fusconaia masoni (Atlantic pigtoe)	C,s,sa,g,co	tactile	6.75h		3
980824.1jaj	Fusconaia masoni (Atlantic pigtoe)	s,c,sa,g,eo,r,det	tactile	eh	-	
980722.1jaj	lanceolate Elliptio (lance)	r,w,s,Sa,G,co,b	tactile/visual		2	_
980722.2jaj	lanceolate Elliptio (lance)	C,s,sa,g,co	tactile	6.75h	15	
980824.1jaj	lanceolate Elliptio (lance)	s,c,sa,g,co,r,det	tactile	49	9	
980824.2jaj	lanceolate Elliptio (lance)	sa,G	visual/tactile	2.33h	-	

Location			Soarch		
Site (date) and species	Substrate	Technique	Time	# Live	# Live # Shells
mussel					
980825.2jaj lanceolate Elliptio (lance)	s,C,sa,g	tactile	0.85h	9	
	S,c,sa,g,co	tactile	1.3h	· *	
980722.1jaj Villosa constricta (notched rainbow)	r,w,s,Sa,G,co,b	tactile/visual		4	
980722.2jaj Villosa constricta (notched rainbow)	C,s,sa,g,co	tactile	6.75h	. 4	4
980824.1jaj Villosa constricta (notched rainbow)	s,c,sa,g,co,r,det	tactile	6h	2	
980824.2jaj Villosa constricta (notched rainbow)	sa,G	visual/tactile	2.33h	. "	
snail				,	
980722.2jaj Campeloma sp. (n/a)	C,s,sa,g,co		6.75h		
980722.2jaj Elimia catenaria (gravel elimia)	C,s,sa,g,co		6.75h	<i>.</i>	
Little River @ SR 2130+					
clam					
980728.3jaj Corbicula fluminea (Asian clam)	w,Sa,co,b		£		
980728.4jaj Corbicula fluminea (Asian clam)	c,s,sa,g,Co		2.5h		
limpet					
980728.3jaj Ancylidae (limpet)	w,Sa,co,b		*		
mussel					
980728.4jaj Alasmidonta undulata (triangle floater)	c,s,sa,g,Co	tactile	2.5h	_	
980728.3jaj Elliptio spp. (n/a)	w,Sa,eo,b	tactile	334	304	
980728.4jaj Elliptio spp. (1v/a)	c,s,sa,g,Co	tactile	2.5h	, &	
980728.3jaj lanceolate Elliptio (lance)	w,Sa,co,b	tactile	4.5 4.5	2 -	
980728.4jaj lanceolate Elliptio (lance)	c,s,sa,g,Co	tactile	25h	٠ ٧	
980728.3jaj Villosa constricta (notched rainbow)	w,Sa,co,b	tactile	4.5	>	-
980728.4jaj Villosa constricta (notched rainbow)	c.s.sa.g.Co	elifort	 2 St	-	- (
snail			116.2	-	7
980728.3jaj Campeloma sp. (n/a)	w,Sa,co,b		5		
980728.4jaj Campeloma sp. (n/a)	c.s.sa.g.Co		7.5%		
980728.4jaj Elimia catenaria (gravel elimia)	c.s.sa.g.Co		2.5h		
980728.3jaj Hydrobiidae (n/a)	w.Sa.co.b		2.5m		
980728-4jaj Physella sp. (physa snail)	c,s,sa,g,Co		2.5h		
Little River @ SR 2320					
clam					
980811.2jaj Corbicula fluminea (Asian clam)	r,w,C,s,Sa,g		=		
mussel	Substrate		The same		
980811.2jaj Elliptio spp. (n/a)	r,w,C,s,Sa,g	tactile	æ	691	
	77				

Location Site (date) and species	Substrate	Technique	Search Time	# Live	# Live # Shells
mussel					
980811.2jaj Lampsilis cariosa (yellow lampmussel)	r,w,C,s,Sa,g	tactile	1h	-	
980811.2jaj lanceolate Elliptio (lance)	r,w,C,s,Sa,g	tactile	Пh	-	
snail					
980811.2jaj Campeloma sp. (n/a)	r,w,C,s,Sa,g		=		
980811.2jaj Pseudosuccinca sp. (n/a)	r,w,C,s,Sa,g		띰		
Little River @ SR 2320-					
clam					
980811.1jaj Corbicula fluminea (Asian clam)	w,c,s,sa		4		-
mussel					-
980811.1jaj Elliptio spp. (n/a)	W,C,S,Sa	tactile	1h	23	
980811.1jaj lanceolate Elliptio (lance)	w,c,s,sa	tactile	Ч	-	
<u>snail</u>					
980811.1jaj Campeloma sp. (1/a)	w,c,s,sa		ЧI		
980811.1jaj Pseudosuccinca sp. (n/a)	w,c,s,sa		Пh		
Little River (a) SR 2339+					
clam					
980804.1jaj Corbicula fluminea (Asian clam)	C,s,sa,g,co		0.75h		
980804.2jaj Corbicula fluminca (Asian clam)	w,c,s,sa,co		0.75h		
mussel					
980804.1jaj Elliptio spp. (n/a)	C,s,sa,g,co	tactile	0.75h	81	
980804.2jaj Elliptio spp. (n/a)	W,C,S,Sa,CO	tactile	0.75h	51	
980804.1jaj lanceolate Elliptio (lance)	C,s,sa,g,co	tactile	0.75h	2	
snail					
980804.1jaj Campeloma sp. (n/a)	C,s,sa,g,co		0.75h		
980804.2jaj Campeloma sp. (n/a)	W,c,s,sa,co		0.75h		
980804.2jaj Helisoma anceps (two-ridge rams-horn)	W,c,s,sa,co		0.75h		
980804.1jaj Physclla sp. (physa snail)	C,s,sa,g,co		0.75h		
Little River (@ SR 2352+					
clam					
980625.2jaj Corbicula fluminea (Asian clam)	r,C,s,Sa		2.5h		
980625.3jaj Corbicula fluminea (Asian clam)	w,C,S,Sa		2.5h		
mussel					
980625.2jaj Elliptio spp. (n/a)	r,C,s,Sa	tactile	2.5h	377	
980625.3jaj Elliptio spp. (n/a)	w,C,S,Sa	tactile	2.5h	383	
	45				

Location			Search		
Site (date) and species	Substrate	Technique	Time	# Live	#Live #Shells
lassel					
980625.2jaj lanceolate Elliptio (lance)	r,C,s,Sa	tactile	2.5h	16	
980625.3jaj lanceolate Elliptio (lance)	w,C,S,Sa	tactile	2.5h	24	
980625.3jaj Utterbackia imbecillis (paper pondshell)	w,C,S,Sa	tactile	2.5h	i –	
snail				•	
980625.2jaj Campeloma sp. (n/a)	r,C,s,Sa		2.5h		
980625.3jaj Campeloma sp. (n/a)	w,C,S,Sa		2.5h		
Long Creek @ NC 96-					
mussel				1	
980518.1jaj none (n/a)	S,sa,g	visual	0.5h		
Middle Creek @ NC 210-					
920910.6jma Elliptio spp. (n/a)			0.7h	ć	
Middle Creek @ NC 50.				1	
mussel					
920518.1jma Alasmidonta heterodon (dwarf wedgemussel)			ŕ	,	
920518.1jma Alasmidonta undulata (triangle floater)			7.	7	
920518.1jma Elliptio spp. (n/a)			7. 7.	781	
950411.1jma Elliptio spp. (n/a)			786	184	
			7.0	74 -	
920518.1jma Pyganodon cataracta (eastern floater)			76		
950411.1jma Strophitus undulatus (creeper)			0.78h		
Middle Creek @ NC 50+					
mssel					
920518.2jma Elliptio spp. (n/a)			3 Sh	691	
920518.2jma Fusconaia masoni (Atlantic pigtoe)			3.5h	701	
920518.2jma Lampsilis radiata (eastern lampmussel)			3.5h	•	
Middle Creek @ NC 50+-					
mussel					
930429.1jma Alasmidonta undulata (triangle floater)				-	
930429.1jma Elliptio spp. (n/a)				48	
930429.1 Jma Lampsilis radiata (castern lampmussel)				-	

Location			Search		
Site (date) and species	Substrate	Technique	e Time	# Live	# Live # Shells
Middle Creek @ SR 1330					
clam					
980820.2tws Corbicula fluminea (Asian clam)	s,sa	SCUBA	1.5h		
mussel					
990719.1tws Elliptio lanceolata (yellow lance)		visual/snorkel		-	
980820.2tws Elliptio spp. (n/a)	s,sa	SCUBA	1.5h	2	
990719.1tws Elliptio spp. (n/a)		visual/snorkel	10h	50	
990719.1tws Fusconaia masoni (Atlantic pigtoe)		visual/snorkel	10h	-	-
Middle Creek @ SR 1504					•
clam					
950901.1tws Corbicula fluminea (Asian clam)	n/a	snorkel	Ih.		
mussel					
950901.1tws Elliptio lanceolata (yellow lance)	n/a	snorkel	ų.	2	
950901.1tws Elliptio spp. (n/a)	n/a	snorkel	H.	64	
Middle Creek @ SR 1507+					
mussel					
920910. Sina Alasmidonta heterodon (dwarf wedgemussel)		•	II.	-	
920910.5jma Elliptio lanceolata (yellow lance)			Ih		2
920910.5jma Elliptio spp. (n/a)			ЧI	69	
920910.5jma Lampsilis radiata (eastern lampmussel)			Ih	2	
920910.5jma lanceolate Elliptio (lance)			lh I	3	
Middle Creek @ SR 1531-					
mussel					
950412.4jma n/a (n/a)			0.78h		
Mill Creek @ SR 1009-					
mussel					
910903.2jma Elliptio spp. (n/a)			2h	40	
910903.2jma lanceolate Elliptio (lance)			2h	52	
Mill Creek @ SR 1009+					
mussel					
920915.1jma Elliptio spp. (n/a)			0.5h	36	
920915.1jma lanceolate Elliptio (lance)			0.5h	4	

Location Site (date) and species	Substrate	Technique	Search	avi. I #	# Live # Sholls	
Mill Creek @ SR 1200-/+				2417	T CHICIES	
mussel						
					2	
940003.1jma Elliptio roanokensis (Roanoke slabshell) 940603.1jma Elliptio snn. (n/a)						
				,		
				- 2		
Moccasin Creek @ SR 2531+				2		
mussel						
910828.1jma Utterbackia imbecillis (paper pondshell)			1.5h			
Moccasin Creek @ NC 231						
crayfish						
911023.1 cmg Cambarus (Depressicambarus) latimanus (n/a)				2		
Neuse River @						
clam						
	s,sa	visual	1.8h			
	s,sa	visual	0.6h	22		
830713.2028ahc Corbicula fluminea (Asian clam)	s,sa	visual	0.5h			
mussel						
830706.2021ahc Elliptio complanata (eastern Elliptio)	s,sa	visual	1.8h	_	"	
830710.2020ahc Elliptio complanata (eastern Elliptio)	s,sa	lensia	0.6h	-	'n	
830713,2028Aahc none (n/a)	s,sa	visual	0.1h	м		
Neuse River Trib @ US 70-/SR 1003						
massel						
910507.2jma none (n/a)						
Neuse River @ SR 1908-						
mussel						
910903.3jma Elliptio congaraca (Carolina slabshell)			1.5h			
910903.3jma Elliptio roanokensis (Roanoke slabshell) 910903.3jma Ellintio snn (n/a)			1.5h	14		
Poody Branch @ CD 1501			1.5h	24		
mussel						
960523.2jma none (n/a)						
	87		nc.v			

Spring (date) and species Substrate Tiechnique Time # Ihve # Shells Ready Branch @ SR 1563 ### Sanco Ih Ih <	Site (date) and species	Substrate		Time	# **** ! #	Shells
Communicus mediniis (Tar River/Athemanic Sang Institute Sang Institute Coffn	mssel	Dubstrate	Technique	A Abbre	# Lilve #	
				4		
S, Sing tractifier (Tar River/Albernaric S, Sing tractifie 0.67h Creek (@. SR. 1525± Creek (@. SR. 1525± Creek (@. SR. 1525± Activated (dwarf wedgernussel) (a) (b) (c) (c) (d) (d) (d) (d) (d) (d	Reedy Branch @ SR 1563					
Ortmannicus) medialis (Tar RivertAbsemate S.sa.g tacifie 0.67h mital (castern Elliptic) Circek (@. SR 1525+ Allans (creeper) (a) (b) (a) (b) (c) (c) (c) (d) (d) (d) (d) (d	940525.3tws none (n/a)	s,sa,co		H.	0	
8,5a,g tactife 0,67h ussel) ussel) ussel) tc,s,Sa,g tactife/visual 2,h tr,c,Sa,g tactife/visual 2,33h	Roadside ditch @ SR 1947 <u>crayfish</u> 920403.3cmg Procambarus (Ortmannicus) medialis (Tar River/Albemarle					
S,sa.g tacilie 0.67h ussed)	Spring Branch @ SR 1001- mussel					-
12h 15.6 16.5 17.6 18.8 1	980603.2jaj none (n/a)	S,sa,g	tactile	0.67հ		
nussel) 0.5h 0.5h 0.5h 0.5h 0.5h 0.5h 0.5h 0.5h	Swift Creek @ n/a mussel			45		
10.5h 0.5h 0.5h 0.5h 0.5h 0.5h 0.5h 0.5h	710221.20na Emprio comprantata (castem Emprio)			İ		
1.05h 0.5h	Swift Creek (a) White Oak Creek (a) SR 1525+ mussel					
9 spp. (n/a) 0.5h itus undulatus (creeper) 0.5h itus undulatus (creeper) 0.5h o spp. (n/a) 0.5h itilis radiata (eastern lampmussel) 1.c.s.Sa.g itantile/visual 2h tantile/visual 2h	940915.7jma Alasmidonta heterodon (dwarf wedgemussel)			0.5h	_ :	
espp. (u/a) o spp. (u/a) o spp. (u/a) o spp. (u/a) ilis radiata (eastern lampnussel) idio ta heterodon (dwarf wedgemussel) tidonta heterodon (dwarf wedgemussel) tota heterodon (dwarf wedgemussel) tota heterodon (dwarf wedgemussel) tota heterodon (dwarf wedgemussel) tro.s.Sa.g tro.s.	940915.7jma Elliptio spp. (n/a) 940915.7jma Strophitus undulatus (creeper)			0.5h 0.5h	120	
o spp. (n/a) o spp. (n/a) ilis radiata (eastern lampmussel) idis radiata (eastern lampmussel) idionta heterodon (dwarf wedgemussel) idonta heterodon (dwarf w	0.10					
spp. (n/a) 0.5h spp. (n/a) 0.5h is radiata (castern lampmussel) 0.5h total at castern lampmussel) 0.5h tonta heterodon (dwarf wedgemussel) r.c.s.Sa.g tactife/visual 2h tonta heterodon (dwarf wedgemussel) r.c.s.Sa.g tactife/visual 2h onta heterodon (dwarf wedgemussel) r.c.s.Sa.g tactife/visual 2h onta heterodon (dwarf wedgemussel) r.c.s.Sa.g tactife/visual 2h onta undulata (triangle floater) r.c.s.Sa.g tactife/visual 2h onta undulata (triangle floater) r.c.s.Sa.g tactife/visual 2h ongaraea (Carolina slabshell) r.c.s.Sa.g tactife/visual 2h	Mussel					
spp. (n/a) 0.5h lis radiata (eastern lampmussel) 0.5h standata (eastern lampmussel) 0.5h standata (eastern lampmussel) 0.5k standata (warf wedgemussel) 0.5s,Sa,g tactile/visual 2h standa heterodon (dwarf wedgemussel) 0.5s,Sa,g tactile/visual 2h standa heterodon (dwarf wedgemussel) 0.5s,Sa,g tactile/visual 2h standa undulata (triangle floater) 0.5s,Sa,g tactile/visual 2h standa undulata (triangle floater) 0.5s,Sa,g tactile/visual 2h standarda (triangle floater) 0.5s,Sa,g tactile/visual 2h standarda (triangle floater) 0.5s,Sa,g tactile/visual 2h standarda (triangle floater) 0.5s,Sa,g tactile/visual 2h	950412.1jma Elliptio spp. (n/a)			0.5h	165	
is radiata (eastern lampmussel) fonta heterodon (dwarf wedgemussel) fonta indulata (triangle floater) fonta undulata (triangle floater) foc.s, Sa,g factile/visual factile/visual fonta tactile/visual fonta tactile/visual fonta undulata (triangle floater) fonta undulata (triangle floater) for.s, Sa,g factile/visual fonta undulata (triangle floater) fonta undulata (triangle floater) fonta undulata (triangle floater) fonta undulata (triangle floater) for.s, Sa,g fonta undulata (triangle floater) for.s	950412.2jma Elliptio spp. (n/a)			0.5h	991	
Jonta heterodon (dwarf wedgemussel) r,c,s,Sa,g tactiie/visual 2h Jonta heterodon (dwarf wedgemussel) r,c,s,Sa,g tactiie/visual 2h Jonta heterodon (dwarf wedgemussel) r,c,s,Sa,g tactile/visual 2.33h Jonta undulata (triangle floater) r,c,s,Sa,g tactile/visual 2h	950412.1jma Lampsilis radiata (eastern lampmussel)			0.5h	-	
Alasmidonta heterodon (dwarf wedgemussel) Alasmidonta undulata (triangle floater) Alasmidonta undulata (tri	Swift Creek @ I-40+					
Alasmidonta heterodon (dwarf wedgemussel) Alasmidonta undulata (triangle floater) Alasmidonta undulata (trian	mussel				_	
Alasmidonta neterodon (dwarf wedgentusset) Alasmidonta heterodon (dwarf wedgentusset) Alasmidonta heterodon (dwarf wedgentussel) Alasmidonta heterodon (dwarf wedgentussel) Alasmidonta heterodon (dwarf wedgentussel) Alasmidonta undulata (triangle floater) Alasmidonta undulata (960521.1 jma Alasmidonta heterodon (dwarf wedgemussel)					
Alasmidonta heterodon (dwarf wedgemussel) Alasmidonta heterodon (dwarf wedgemussel) Alasmidonta undulata (triangle floater) T,c,s,Sa,g F,c,s,Sa,g Fightio congaraea (Carolina slabshell) T,c,s,Sa,g Tactile/visual T,c,s,Sa,g Tactile/visual T,c,s,Sa,g Tactile/visual T,c,s,Sa,g Tactile/visual T,c,s,Sa,g Tactile/visual T,c,s,Sa,g Tactile/visual T,c,s,Sa,g		o Sa o	tactile/visual	2h	- 2	_
Alasmidonta heterodon (dwarf wedgemussel) Alasmidonta undulata (triangle floater) Alasmidonta undulata (triangle floater) Alasmidonta undulata (triangle floater) Alasmidonta undulata (triangle floater) T.C.S.Sa,g T.C.S.Sa,g Tactile/visual The strict of triangle floater) T.C.S.Sa,g Tactile/visual Tactile/visual T.C.S.Sa,g Tactile/visual T.C.S.Sa,g Tactile/visual T.C.S.Sa,g Tactile/visual T.C.S.Sa,g		r.c.s.Sa.g	tactile/visual	Zh	2	
Alasmidonta undulata (triangle floater) Alasmidonta undulata (triangle floater) Alasmidonta undulata (triangle floater) T,c,s,Sa,g T,c,s,Sa,g T,c,s,Sa,g T,c,s,Sa,g Tactilc/visual 2.33h		r,c,s,Sa,g	tactile/visual	2.33h	4	
Alasmidonta undulata (triangle floater) r,c,s,Sa,g tactile/visual 2h Alasmidonta undulata (triangle floater) r,c,s,Sa,g tactile/visual 2h Elliptio congaraea (Carolina slabshell) r,c,s,Sa,g tactile/visual 2.33h	960521.2jma Alasmidonta undulata (triangle floater)				-	
Alasmidonta undulata (triangle floater) r,c,s,Sa,g tactilc/visual 2h Elliptio congaraea (Carolina slabshell) r,c,s,Sa,g tactilc/visual 2.33h	970729.1jaj Alasmidonta undulata (triangle floater)	r,c,s,Sa,g	tactile/visual	2h	3	
Elliptio congaraca (Carolina slabshell) r,c,s,Sa,B		r,c,s,Sa,g	tactile/visual	2h	S	
			tactile/visual	2.33h	-	

Search Technique Time # Live # Shells		_	_	2	tactile/visual 2h 2	tactile/visual 2.33h 1				tactile/visual 2h 328	tactile/visual 2h 381	tactile/visual 2h 324	tactile/visual 2.33h 454	_	tactile/visual 2h 2	tactile/visual 2h 2	tactile/visual 2.33h 2	tactile/visual 2h 1	tactile/visual 2h 1	tactile/visual 2h 1		tactile/visual 2h 1	tactile/visual 2h 2	tactile/visual 2.33h 3	tactile/visual 2h 1	taetile/visual 2.33h	tactile/visual 2,33h			<u>e</u>				1h 2 1h 118	
Substrate					r,c,s,Sa,g	r,c,s,Sa,g				r,c,s,Sa,g	r,c,s,Sa,g	r,e,s,Sa,g	r,c,s,Sa,g		r,c,s,Sa,g	r,e,s,Sa,g	r,c,s,Sa,g	r,c,s,Sa,g	, r,c,s,Sa,g	r,c,s,Sa,g		r,c,s,Sa,g	r,c,s,Sa,g	r,c,s,Sa,g	1,0,5,8a,8	7.5.5.3.7	r,c,s,Sa,g								20
Location Site (date) and species	lassel lassel	960521.1jma Elliptio lanceolata (yellow lance)	960521.2jma Elliptio lanceolata (yellow lance)	960521.3jma Elliptio lanecolata (yellow lance)	970729.2jaj Elliptio lanceolata (yellow lance)	971013.1jaj Elliptio roanokensis (Roanoke slabshell)	960521.1jma Elliptio spp. (n/a)	960521.2jma Elliptio spp. (n/a)	960521.3jma Elliptio spp. (n/a)	970729.1jaj Elliptio spp. (n/a)	970729.2jaj Elliptio spp. (n/a)	970729.3jaj Elliptio spp. (n/a)	971013. Jjaj Elliptio spp. (n/a)	960521.1jma Fusconaia masoni (Atlantic pigtoe)	970729.1jaj Fusconaia masoni (Atlantic pigtoc)	970729.2jaj Fusconaia masoni (Atlantic pigtoc)	971013.1jaj Fusconaia masoni (Atlantic pigtoe)	970729.1jaj Lampsilis radiata (castern lampmussel)	970729.2jaj Lampsilis radiata (castern lampmussel)	970729.3jaj Lampsilis radiata (castern lampmussel)	960521.2jma Strophitus undulatus (creeper)	970729. Ijaj Strophitus undulatus (creeper)	970729.3jaj Strophitus undulatus (creeper)	971013.1jaj Strophitus undulatus (creeper)	970729.2jaj Utterbackia imbecillis (paper pondshell)	snail 971013.1iai Campeloma sp. (n/a)	971013.1jaj Physclla sp. (physa snail)	Swift Creek @ NC 210	mussel	910327.3jma Elliptio complanata (castern Elliptio)	Swift Creek @ NC 210-	mussel	920911.1jma Elliptio lanceolata (yellow lance)	920911.1jma Elliptio roanokensis (Roanoke slabshell)	المرا

ocation			Search		
Site (date) and species	Substrate	Technique	Lime	# Live # Shells	Shells
mussel					
950410.1 jma Elliptio spp. (n/a)			0.7Sh	01	
920911.1jma Lampsilis radiata (eastern lampmussel)			Ч	4	
Swift Creek @ NC 210+					
mussel					
950410.2jma Elliptio spp. (n/a)			0.82h	36	
- Swift Creek @ NC 42/SR 1525					
mussel					
940901.0jma Alasmidonta heterodon (dwarf wedgemussel)			0.2h	-	•
940901.4jma Alasmidonta heterodon (dwarf wedgemussel)			0.3h	-	
940901.3jma Alasmidonta undulata (triangle floater)			0.2h	_	
940901.3jma Elliptio lanceolata (yellow lance)			0.2h	_	
940901.0jma Elliptio spp. (n/a)			0.2h	12	
			0.2h	19	
940901.2jma Elliptio spp. (n/a)			0.2h	100	
940901.3jma Elliptio spp. (n/a)			0.2h	49	
940901.4jma Elliptio spp. (n/a)			0.3h	75	
			0.2h		_
940901.2jma Fusconaia masoni (Atlantic pigtoe)			0.2h	-	
940901.3jma Fusconaia masoni (Atlantic pigtoe)			0.2h	_	
940901.5jma Lampsilis radiata (eastern lampmussel)				-	
940901.2jma Pyganodon cataracta (eastern floater)			0.2h	_	
Swift Creek @ SR 1501-					
mussel					
910327.1jma Alasmidonta heterodon (dwarf wedgemussel)			3h	-	
910327.1jma Elliptio complanata (eastern Elliptio)			3h	101	
910327.1jma Elliptio icterina (variable spike)			3h	61	
910327.1jma Elliptio lanceolata (yellow lance)		1	3h		_
960523.1jma Elliptio lanceolata (yellow lance)			2.3h		_
920911.2jma Elliptio roanokensis (Roanoke slabshell)			П	2	
950410.3jma Elliptio roanokensis (Roanoke slabshell)			0.77h	2	
920911.2jma Elliptio spp. (n/a)			H.	143	
950410.3jma Elliptio spp. (1/a)			0.77h	61	
960523.1jma Elliptio spp. (n/a)			2.3h	29	
920911.2jma Fusconaia masoni (Atlantic pigtoe)			æ	-	
920911.2jma Lampsilis radiata (eastern lampmussel)			면	2	

ocation Site (date) and snecies	Substrate	Technique	Search Time	# Live # Shells	Shells
and and and					
Swift Creek @ SR 1525-					
clam			į		
970728.1jaj Corbicula fluminea (Asian clam)	r,C,s,Sa	tactile/visual	2h		
970728.2jaj Corbicula fluminea (Asian clam)	r,c,s,Sa,g	tactile/visual	2h		
970728.3jaj Corbicula fluminea (Asian clam)	r,c,s,Sa,g	tactile/visual	2h		
970728.4jaj Corbicula fluminea (Asian clam)	r,c,s,Sa,g	tactile/visual	2h		
mussel					
970728.4jaj Alasmidonta heterodon (dwarf wedgemussel)	r,c,s,Sa,g	tactile/visual	2h	m	
970728.4jaj Alasmidonta undulata (triangle floater)	r,c,s,Sa,g	tactile/visual	2h	6	
920911.4jma Elliptio lanceolata (yellow lance)			Пh		2
970728.1jaj Elliptio lanceolata (yellow lance)	r,C,s,Sa	tactile/visual	2h	prod	
970728.3jaj Elliptio lanceolata (yellow lance)	r,c,s,Sa,g	tactile/visual	2h	-	
920911.4jma Elliptio spp. (n/a)			Ιħ	195	
970728.1jaj Elliptio spp. (n/a)	r,C,s,Sa	tactilc/visual	2h	273	
970728.2jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactilc/visual	2h	390	
970728.3jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactile/visual	2h	267	
970728.4jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactile/visual	2h	499	
920911.4jma Fusconaia masoni (Atlantic pigtoe)			1h		general
970728.2jaj Fusconaia masoni (Atlantic pigtoe)	r,c,s,Sa,g	tactile/visual	2h	_	
970728.3jaj Fusconaia masoni (Atlantic pigtoe)	r,c,s,Sa,g	tactile/visual	2h	2	
970728.4jaj Fusconaia masoni (Atlantic pigtoe)	r,c,s,Sa,g	tactile/visual	2h		
920911.4jma Lampsilis radiata (eastern lampmussel)			H.	_	
970728.2jaj Lampsilis radiata (eastern lampmussel)	r,c,s,Sa,g	tactile/visual	2h	2	
970728.3jaj Lampsilis radiata (eastern lampmussel)	r,c,s,Sa,g	tactile/visual	2h	_	
920911.4jma Strophitus undulatus (creeper)			1h	2	
970728.2jaj Strophitus undulatus (creeper)	r,c,s,Sa,g	tactile/visual	2h	2	
970728.3jaj Strophitus undulatus (creeper)	r,c,s,Sa,g	tactile/visual	2h	3	
snail					
970728.3jaj Campeloma sp. (п/а)	r,c,s,Sa,g	tactile/visual	2h		
Swift Creek @ SR 1525+					
mussel					
			H.	-	
			Ih.	_	
940915.3jma Elliptio lanceolata (yellow lance)			0.2h		
			II H	255	
	Ç				

ocation			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	# Shells
<u>lanssel</u>					
940915.2jma Elliptio spp. (n/a)			0.8h	190	
940915.3jma Elliptio spp. (n/a)			0.2h	20	
940915.5jma Elliptio spp. (n/a)			0.2h	3	
940915.6jma Elliptio spp. (n/a)				62	
940915.3jma Fusconaia masoni (Atlantic pigtoe)			0.2h	_	
940915.4jma Fusconaia masoni (Atlantic pigtoe)			0.2h	4	
940915.1jma Lampsilis radiata (eastern lampmussel)			lh	-	
940915.2jma Strophitus undulatus (creeper)			0.8h	-	
940915.5jma Strophitus undulatus (creeper)			0.2h	-	•
940915.6jma Strophitus undulatus (creeper)				_	
Swift Creek @ SR 1555					
crayfish					
920421.1cmg Orconectes (Procericambarus) carolinensis (NC spiny crayfish) mussel				-	
970730.1jaj Alasmidonta undulata (triangle floater)	r,c,s,Sa,g	tactile/visual	1.33h		2
970730.2jaj Alasmidonta undulata (triangle floater)	r,c,s,Sa,g	tactile/visual	2h	2	
970730.1jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactile/visual	1.33h	54	
970730.2jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactile/visual	2h	185	
970730.3jaj Elliptio spp. (n/a)	r,c,s,Sa,g	tactile/visual	1.6h	175	
970730.2jaj Fusconaia masoni (Atlantic pigtoe)	r,c,s,Sa,g	tactile/visual	2h		_
970730.3jaj Fusconaia masoni (Atlantic pigtoe)	r,c,s,Sa,g	tactile/visual	1.6h	-	
970730.2jaj Lampsilis radiata (eastern lampmussel)	r,c,s,Sa,g	tactile/visual	2h	_	
970730.3jaj Strophitus undulatus (creeper)	r,c,s,Sa,g	tactile/visual	1.6h	_	
Swift Creek @ SR 1555-					
<u>mussel</u>					
910411.1jma Alasmidonta heterodon (dwarf wedgemussel)			11		-
920319.2jma Alasmidonta heterodon (dwarf wedgemussel)			2h	2	
910327.4jma Alasmidonta undulata (triangle floater)			0.5h		
910411.1jma Alasmidonta undulata (triangle floater)			Пh		2
970623.1jaj Alasmidonta undulata (triangle floater)	s,Sa,g,c,bo	tactile/visual	0.5h	4	
910327.4jma Elliptio complanata (eastern Elliptio)			0.5h		
910411.1jma Elliptio complanata (eastern Elliptio)			Ιŀ	129	
910327.4jma Elliptio icterina (variable spike)			0.5h		
910411.1jma Elliptio icterina (variable spike)			Пh	27	
910327.4jma Elliptio roanokensis (Roanoke slabshell)			0.5h		

Location Site (date) and species	Substrate	Technique	Search Time	# Live # Shells
lessel l				
910411.1jma Elliptio roanokensis (Roanoke slabshell)			-52	13
950411.2jma Elliptio roanokensis (Roanoke slabshell)			0.33h	2
950411.4jma Elliptio roanokensis (Roanoke slabshell)			0.33h	7
950411.5jma Elliptio roanokensis (Roanoke slabshell)			0.33h	4
950411.6jma Elliptio roanokensis (Roanoke siabshell)			0.33h	∞
960523.4jma Elliptio roanokensis (Roanoke slabshell)			er.	gracq
- 970623.1jaj Elliptio roanokensis (Roanoke słabshell)	s,Sa,g,c,bo	tactile/visual	0.5h	3
950411.2jma Elliptio spp. (n/a)			0.33h	132
950411.4jma Elliptio spp. (n/a)			0.33h	.89
950411.5jma Elliptio spp. (n/a)			0.33h	51
950411.6jina Elliptio spp. (n/a)			0.33h	122
950411. Jima Elliptio spp. (n/a)			0.33h	parent parent
			31	822
970623.1jaj Elliptio spp. (n/a)	s,Sa,g,c,bo	tacille/visual	0.5h	186
910327.4jma Fusconaia masoni (Atlantic pigtoe)			0.5h	
910411.1jma Fusconaia masoni (Atlantic pigtoc)				paras.
960523.4jma Fusconaia masoni (Atlantic pigtoe)			32	en
970623.1jaj Fusconaia masoni (Atlantic pigtoe)	s,Sa,g,c,bo	tactile/visual	0.5h	4
910327.4jma Lampsilis radiata (eastern fampmussel)			0.5h	
910411. Ijma Lampsilis radiata (eastern fampmussel)			oles oles oles oles	position.
950411.2jma Lampsilis radiata (eastern lampmussel)			0.33h	gant
950411.5jma Lampsilis radiata (eastern lampmussel)			0.33h	\$1000
970623.1jaj Lampsilis radiata (eastern lampmussel)	s,Sa,g,c,bo	tactile/visual	0.Sh	
910411.1jma Lasmigona subviridis (green floater)			T	general)
910327.4jma Strophitus undulatus (creeper)			0.5h	
910411.1jma Strophitus undulatus (creeper)			parts parts	tones
950411.2jma Strophitus undulatus (creeper)			0.33h	pwork
970623.1jaj Strophitus undulatus (creeper)	s,Sa,g,c,bo	tactile/visual	0.5h	F-04
910411.1jma Villosa constricta (notched rainbow)			=	2
960523.4jma Villosa constricta (notched rainbow)			3h	ponq
Swift Creek @ SR 1555+				
mussel				
960522.1jma Alasmidonta undulata (triangle floater)				2
960522.2jma Alasmidonta undulata (triangle floater)				2
960522.1jma Elliptio congaraea (Carolina slabshell)				-
				E
911113.1jma Elliptio roanokensis (Roanoke slabshell)			q	
	54			

ocation			Search		
Site (date) and species	Substrate	Technique	Time	# Live # Shells	ells
mussel					
950411.3jma Elliptio roanokensis (Roanoke slabshell)			0.42h	3	
960522.4jma Elliptio roanokensis (Roanoke slabshell)				2	
911113.1jma Elliptio spp. (n/a)			H		
950411.3jma Elliptio spp. (n/a)			0.42h	36	
960522.1jma Elliptio spp. (n/a)				601	
960522.2jma Elliptio spp. (n/a)					
960522.4jma Elliptio spp. (n/a)					
960522.1jma Fusconaia masoni (Atlantic pigtoe)				2	
960522.4jma Fusconaia masoni (Atlantic pigtoe)				-	•
960522.4jma Lampsilis radiata (eastern lampmussel)				_	•
960522.3jma lanceolate Elliptio (lance)				2	
960522.4jma lanceolate Elliptio (lance)				4	
Swift Creek @ SR 1562					
clam					
940525.5tws Corbicula fluminea (Asian clam)	sa,g,co		0.5h		
lassel					
940525.5tws Elliptio lanceolata (yellow lance)	sa,g,co		0.5h	81	
940525.5tws Elliptio spp. (n/a)	sa,g,co		0.5h	14	
Swift Creek @ SR 1562-					
mussel					
920911.3jma Alasmidonta undulata (triangle floater)			Ч	_	
960522.5jma Alasmidonta undulata (triangle floater)				2	
960522.5jma Elliptio congaraea (Carolina slabshell)					
920911.3jma Elliptio lanceolata (yellow lance)			Пh	3	
960522.5jma Elliptio roanokensis (Roanoke slabshell)				_	
920911.3jma Elliptio spp. (n/a)			1h	131	
960522.5jma Elliptio spp. (n/a)					
920911.3jma Lampsilis radiata (eastern lampmussel)			4	4	
920911.3jma Strophitus undulatus (creeper)			П	-	
920911.3jma Villosa constricta (notched rainbow)			11	_	
960522.5jma Villosa constricta (notched rainbow)				-	
Swift Creek @ SR 1562+					
mussel					
4jma			0.67h	2	
950410.4jma Elliptio spp. (n/a)			0.67h	26	

Location			Search	π ···: 1 π	
Site (date) and species	Substrate	lecunidae	1 Ime	# Live # Sneits	Sueits
mussel 950410.4ima Strophitus undulatus (creener)			0.67h	_	
White Oak Creek @ NC 42					
clam					
991027.1tws Corbicula fluminea (Asian clam)					
massel					
991027.1tws Elliptio spp. (n/a)				3	2
991027.1tws Utterbackia imbecillis (paper pondshell)					10
White Oak Creek (a) NC 42+				1.	
mussel					
920420. ijma Alasmidoma heterodon (dwarf wedgemussel)			- C-	grave .	
920420. Jima Elliptio complanata (eastern Elliptio)			11	86	
920420.1jma Elliptio icterina (variable spike)			Пh	27	
920420. Ijma Pyganodon cataracta (eastern floater)			Ih		
920420.1jma Utterbackia imbecillis (paper pondshell)			Пh		
Johnston/Wayne County line					
Mill Creek @ SR 1212					
mussel					
940603.1tws Alasmidonta undulata (triangle floater)	n/a	visual			
940525.1tws Elliptio lanceolata (yellow lance)	n/a	snorkel	드	2	
940525.1tws Elliptio roanokensis (Roanoke slabshell)	n/a	snorkel	Пh	9	
940525.1tws Elliptio spp. (n/a)	n/a	snorkel	1h	25	
940603.1tws Lampsilis radiata (eastern lampmussel)	n/a	visual			
940525.1tws lanceolate Elliptio (lance)	n/a	snorkel	Пh	Ś	

Table 4. Freshwater fish species collected during the Johnston County aquatic inventory.

Amblyopsidae Chologaster cornuta swampfish Amiidae Amia calva bowfin Anguillidae Anguilla rostrata american eel Aphredoderidae Aphredoderus sayanus pirate perch Catostomidae Erimyzon oblongus creek chubsucker Hypentelium nigricans northern hogsucker Moxostoma collapsum v-lip redhorse Scartomyzon cervinus black jumprock Centrarchidae Centrarchus macropterus flier Chaenobyrttus gulosus warmouth Enneacanthus gloriosus bluespotted sunfish Lepomis auritus redbreast sunfish Lepomis cyanellus green sunfish Lepomis gibbosus pumpkinseed sunfish Lepomis macrochirus bluegill sunfish Micropterus salmoides largemouth bass Clupeidae Alosa sapidissima American shad Cyprinidae Cyprinella analostana satinfin shiner Hybognathus regius eastern silvery minnow Luxilus albeolus white shiner Lythrurus matutinus pinewoods shiner Nocomis leptocephalus bluehead chub Notemigonus crysoleucas golden shiner dusky shiner Notropis cummingsae Notropis procne swallowtail shiner Elassomatidae Elassoma zonatum banded pygmy sunfish Esocidae

Esox americanus

redfin pickerel

Table 4 (cont.). Freshwater fish species collected during the Johnston County aquatic inventory.

Ictaluridae	
Ameiurus catus	white catfish
Ameiurus natalis	yellow bullhead
Ameiurus platycephalus	flat bullhead
Ictalurus punctatus	channel catfish
Noturus gyrinus	tadpole madtom
Noturus insignis	margined madtom
Pylodictus olivaris	flathead catfish
Lepisosteidae	
Lepisosteus osseus	longnose gar
Percidae	
Etheostoma flabellare	fantail darter
Etheostoma fusiforme	swamp darter
Etheostoma nigrum/olmstedi	johnny/tesselated darter
. Etheostoma serrifer	sawcheek darter
Etheostoma vitreum	glassy darter
Percina peltata	shield darter
Percina roanoka	Roanoke darter
Poeciliidae	
Gambusia holbrookii	eastern mosquitofish
Umbridae	
Umbra pygmaea	eastern mudminnow

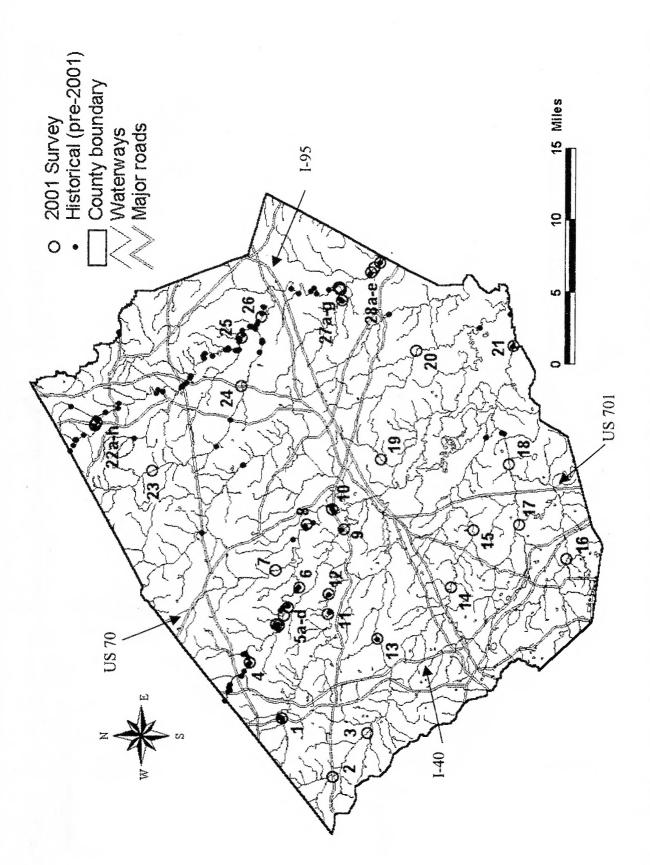


Figure 1. Sites surveyed during the aquatic inventory of Johnston County, 2001 (numbered open circles; see Table 1 for detailed information). Also shown here are historical sites (black dots) that were surveyed previous to 2001.

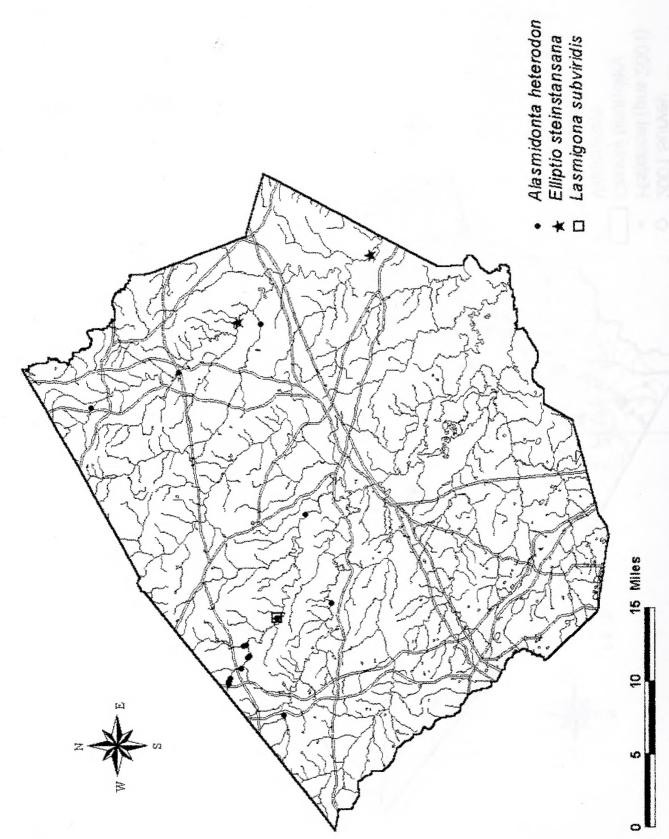


Figure 2a. State endangered aquatic species occurrences documented in the aquatic inventory of Johnston County (all years).

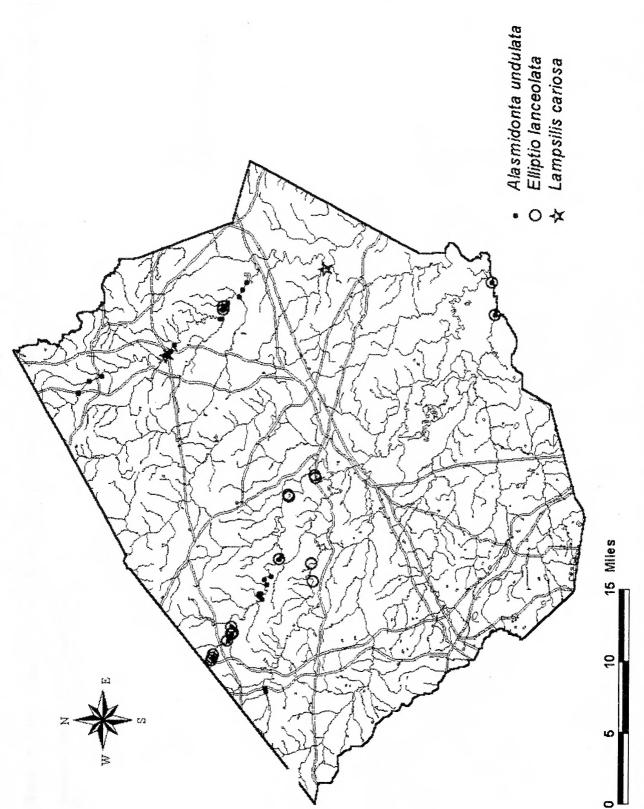


Figure 2b. State threatened aquatic species (part I) occurrences documented in the aquatic inventory of Johnston County (all years).

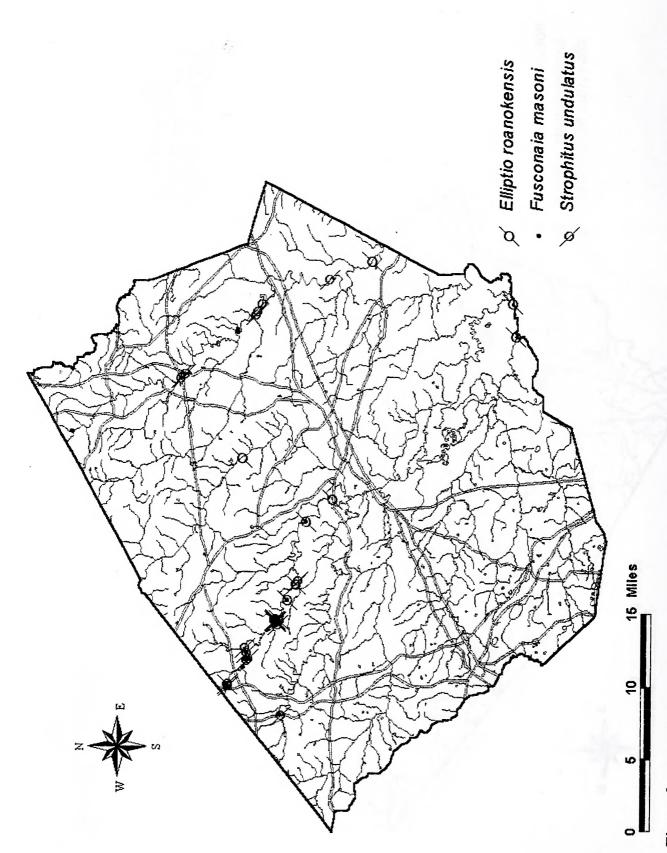


Figure 2c. State threatened aquatic species (part II) occurrences documented in the aquatic inventory of Johnston County (all years).

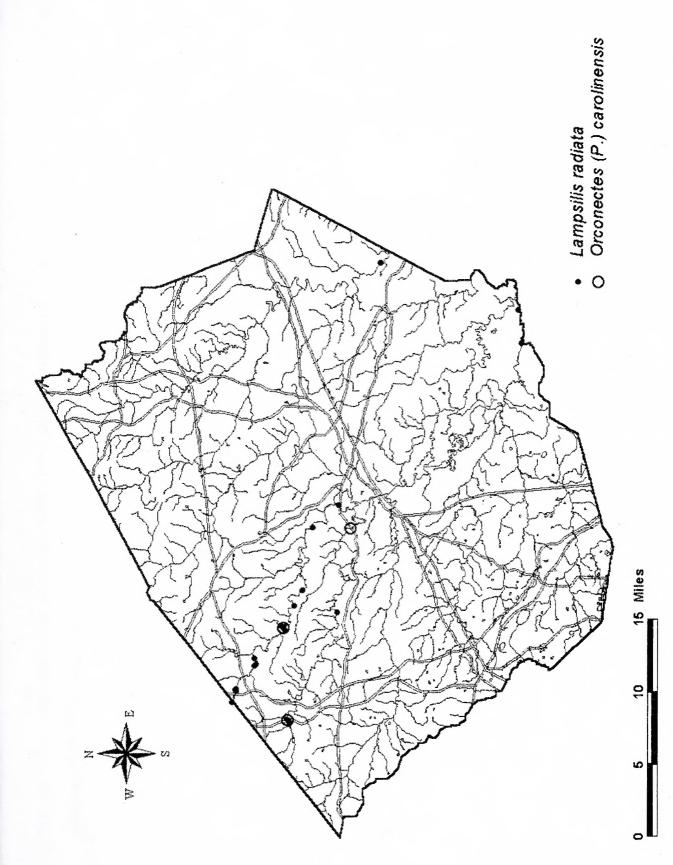


Figure 2d. State special concern aquatic species occurrences documented in the aquatic inventory of Johnston County (all years).

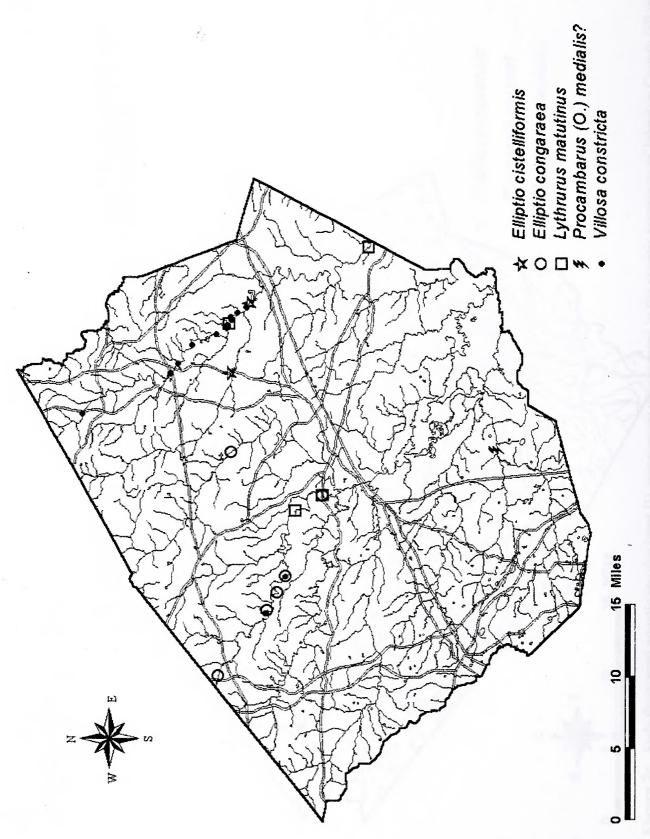


Figure 2e. Significantly rare (watch list) aquatic species occurrences documented in the aquatic inventory of Johnston County (all years).



